THE POWER OF THE SOU OVER THE BODY.

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ELEMENTS OF LOGIC.

COMPILED

FOR THE USE OF YOUTHS IN INDIA.

BY

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PREFACE.

The following work is intended as a part of that series of original elementary treatises now publishing at the Serampore Press for the use of Youths in India.

The subject is confessedly unpopular. It has been selected, however, not merely from personal predilection, but from a real conviction of its utility. The misconceptions and prejudices that prevail respecting Logic are too deeply rooted to be easily or speedily eradicated, but were the Science known in its true principles and application, it could not fail to obtain a prominent place in every system of liberal education. It is not only recommended by its venerable antiquity, and the universal dominion which it once exercised over the learned world; but it is intimately connected with the philosophy of language, and the philosophy of the human mind. It forms and cultivates some of our most valuable

mental habits, and its intimate relation to daily practice can scarcely be denied.

Works on Logic are not easily procurable in India, and those that are most common are calculated rather to bewilder than to direct the youthful student. To remedy this evil is the object of the following treatise. It is intended as a convenient introduction to this branch of study, adapted for the use of Schools in India, and is more particularly suited for those who are entering on the study of Mental Philosophy. It traces the history of the Science of Reasoning from the earliest period to the present time, it unfolds its fundamental principles and rules, accompanied with appropriate illustrations, and points out, at considerable length, its application to practical purposes. The limits of the work rendered it necessary that brevity should be as much as possible studied. It is hoped, however, that nothing really essential to the subject has been overlooked.

In compiling this work the Author has availed himself most freely of the labours of his predecessors. He has consulted several Compendiums of Aristotle's Logic which are used as Class-Books in the Universities of Europe. He has taken without scruple from the works

of Bacon, Campbell, Reid, Stewart, Jardine, Duncan, and other writers on Logic and Mental Philosophy, whatever appeared most suitable to his purpose. To the admirable work of Dr. Whately he acknowledges, in a particular manner, his obligations. Some parts of the following treatise may be viewed almost as an abridgement of that standard work. The compilation, however, is original, and a considerable portion of it was composed several years ago, before the Author had an opportunity of consulting *Whately's Elements*. He has, however, in preparing the work for the press, borrowed from that work both valuable remarks and numerous illustrations. This has been the case particularly in the Chapter on Fallacies, which the Archbishop has discussed with uncommon ability.

When availing himself of the help of others, the Author has thought it unnecessary to point out particularly the sources whence he has derived his information. In many cases this would have been impossible, as the truths brought forward have been so long familiar to the mind that the sources whence they were originally derived have been forgotten. In any case to have brought forward authorities would have been of no service.

What has once been communicated to the world has become public property, and it is only with regard to new or debatable opinions in literary and scientific matters that authorities are of any value. The language of an able writer, in reference to another department of science, may be applied to the subject now before us.

The advanced state of a science is but the accumulation of the discoveries and inventions of many: to refer each of these to its author is the business of the history of the science, but does not belong to a work which professes merely to give an account of the science as it is. All that is generally acknowledged must pass current from author to author."*

SHREWSBURY,
2d May, 1836.

* Brett's Principles of Astronomy, p. v.

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APPENDIX.

PRAXIS OF LOGICAL ANALYSIS.

"As the rules of Logic apply to an argument only after it has been exhibited, in its bare elementary form, it may not be useless to premise here some remarks on the proper method of analysing and reducing it to that form, especially as this must ordinarily be the first step taken in an attempt to apply the rules of logic.

"First, then, of whatever length the reasoning may be, whether book, pamphlet, or paragraph, begin with the concluding assertion,* and tracing the reasoning backwards, see on what ground that assertion is made. The assertion will be your conclusion, the ground on which it rests, your premises. The whole syllogism thus obtained may then be tried by the rules of logic.

"Secondly, if no error be detected, then take your premises separately, and pursue with each the same course as you before pursued with respect to the conclusion. Your premise must have been used as such, either because it required no proof, or because it had been proved. If it have not been proved, see whether it be so self-evident as to have required no proof; if it have been

* The assertion will not necessarily be the last sentence, but the last point proved, and this whether it be formally enunciated or not.

proved, then consider it in the light of a conclusion derived from other assertions which were premises to it. The process with which you set out will now be repeated: see what grounds are given for the assertion; state these as premises, and the assertion as the conclusion; and apply as before the proper rules to what will then be a syllogism. Having satisfied yourself of the correctness of this, proceed as before to convert your premises, if needful, into conclusions derived from former assertions. The investigation will thus go on, if the whole chain of reasoning be correct, until you arrive at the premises with which it all commences; (which, of course, must be always assertions requiring no proof;) or, if the reasoning be any where incorrect, until you meet with some premise unfairly assumed as such, either as not being proved, yet requiring proof, or as being incorrectly deduced as a conclusion from other assertions.

"It will often happen that the same assertion will have been proved by several different arguments; and then your inquiry into the truth of the premises will branch out, as in the examples given. In this case, you may observe, you have first to try each argument separately; and should the conclusions be probable,* not only to satisfy yourself that each has been correctly drawn, but to calculate the amount of aggregate probability. In this calculation, logic only so far assists, as it places the several sums of probability, (if I may use the expression,) in the most convenient form: but even this assistance will not be thought lightly of by any who duly appreciates the difficulty of estimating the comparative value

* *Probable*, as opposed to a *demonstrated* assertion, which of course could not be rendered more certain by additional proofs.

of probabilities, and the supreme importance of a right habit of doing so, in all questions, not of philosophy and literature alone, but of life.

"EXAMPLE OF ANALYSIS.

"When we consider the deplorable ignorance and inconceivable depravity of the heathen world before the birth of Christ, which rendered a divine interposition essentially necessary, and therefore highly probable; the appearance of Christ upon earth, at the very time when his presence was most wanted, and when there was a general expectation throughout the east, that some great and extraordinary personage was soon to come into the world; the transcendent excellence of our Lord's character, so infinitely beyond that of every other moral teacher; the calmness, the composure, the dignity, the integrity, the spotless sanctity of his manners, so utterly inconsistent with every idea of enthusiasm or imposture; the sublimity and importance of his doctrines; the consummate wisdom and perfect purity of his moral precepts, far exceeding the natural powers of a man born in the humblest situation, and in a remote and obscure corner of the world, without learning, education, languages, or books, the rapid and astonishing propagation of his religion, in a very short space of time, through almost every region of the east, by the sole efforts of himself and a few illiterate fishermen, in direct opposition to all the power, the authority, the learning, the philosophy, the reigning vices, prejudices, and superstitions of the world, the complete and marked opposition, in every essential point, between the character and religion of Christ, and the character and religion of Mahomet, ex-

actly such as might be expected between truth and falsehood; the minute description of all the most material circumstances of his birth, life, sufferings, death, and resurrection, given by the ancient prophets many hundreds years before he was born, and exactly fulfilled in him, and him only, pointing him out as the Messiah of the Jews and the Redeemer of mankind; the various prophecies delivered by Christ himself, which were all punctually accomplished, more especially the destruction of Jerusalem by the Romans, the many astonishing miracles wrought by Jesus, in the open face of day, before thousands of spectators, the reality of which is proved by multitudes of the most unexceptionable witnesses, who sealed their testimony with their blood, and was even acknowledged by the earliest and most inveterate enemies of the Gospel; and lastly, that most astonishing and well authenticated miracle of our Lord's resurrection, which was the seal and confirmation of his own divine origin, and that of his religion: when all these various evidences are brought together, and impartially weighed, it seems hardly within the power of a fair and ingenuous mind to resist the impression of their united force. If such a combination of evidence as this is not sufficient to satisfy an honest inquirer into truth, it is utterly impossible that any event which passed in former times, and which we did not see with our own eyes, can ever be proved to have happened, by any degree of testimony whatever. It may safely be affirmed, that no instance can be produced of any one fact or event, said to have taken place in past ages, and established by such evidence as that on which the Christian religion rests, that afterwards turned out to be false. We challenge the enemies of our faith to bring forward, if they can,

any such instance. If they cannot, (and we know it to be impossible,) we have a right to say, that a religion, supported by such an extraordinary accumulation of evidence, must be true; and that all men who pretend to be guided by argument and by proof, are bound, by the most sacred obligations, to receive the religion of Christ as a real revelation from God."—*Bp. Porteus's Summary of Evidences*, p. 120, &c.

"§ ANALYSIS.

I.

" The religion of Christ is a real revelation from God.

" Premise. It is declared to be so by an extraordinary accumulation of evidence.

II.

" It is declared to be so by an extraordinary accumulation of evidence.

" Premise. It is declared to be so by § the evidence of miracles wrought by Christ; § of prophecies delivered by Christ; § of ancient prophecies; § of its dissimilarity to the religion of Mahomet; § of the circumstances under which it was preached and propagated, § of its internal character; § of the character of its founder; § of the expectation of the heathen world; § and of the need of the heathen world.

" [Note. This taken as one proposition is the minor premise, by which you prove the assertion; but in order to prove this premise, it is requisite to break it into dis-

tinct propositions, and to make each the conclusion of a separate syllogism.]

III.

"It is declared to be so by the evidence of miracles wrought by Christ.

"Premise, (each belonging to a distinct syllogism, the assertion being the common conclusion of all those syllogisms.)

"§ It is declared to be so by Christ's resurrection.

"§ It is declared to be so by his healing the sick, &c

IV.

"That by these miracles it is declared to be so is certain

"Major Premise. What the Christian witnesses have attested is certain.

"Minor Premise. That by these miracles it is declared to be so, is what the Christian witnesses have attested.

V.

"What the Christian witnesses have attested is certain

"Premise. That they attest who seal their testimony with their blood is certain.

VI.

"That by these miracles it is declared to be so, is what the Christian witnesses have attested.

"Premise. What St. Matthew, St. John, &c. have attested, is what the Christian witnesses have attested.

VII.

" The religion of Christ declared to be a real revelation from God, by the evidence of Christ's prophecies.

" Premises, (each belonging to a distinct syllogism, the assertion being the common conclusion of all those syllogisms.)

" § It is declared to be so by his prophecy, that he should be delivered to the gentiles.

" § ——— that he should be betrayed by Judas.

" § ——— that Jerusalem should be destroyed, and its destruction attended with certain circumstances specified, &c.

" In this manner the learner may proceed until he arrives at the first assertion in the chain of reasoning. Farther practice he will easily provide for himself. Leslie's Short and Easy Method with the Deists will be found particularly well adapted for this purpose.

" It will be observed, that in all the syllogisms but one of the above analysis, a premise has been suppressed, because requiring no proof, and easily supplied by the learner himself. In the first syllogism, *e. g.* you readily perceive that the major premise must be, 'Whatever is declared to be so by an extraordinary accumulation of evidence is a real revelation from God,' and that the syllogism expressed fully is,

" Whatever is declared to be so by an extraordinary accumulation of evidence is a real revelation from God.

" The religion of Christ is declared to be so by an extraordinary accumulation of evidence.

" The religion of Christ is a real revelation from God.

'Another point to be noticed is, that the same proposition used in different syllogisms may require to be differently expressed, in order to render the argument in each *formally* correct; which is always allowable, provided the exact meaning be preserved. If, *e. g.* the proposition be, 'The Christian revelation is supported by an extraordinary accumulation of evidence,' I am authorised to state the same differently; thus, 'The evidence in support of the Christian revelation is extraordinarily accumulated.'"—*Preface of Hinds's Introduction to Logic.*

THE END.

ERRATA.

Page 24, last line, omit the comma after because.
Page 25, line 11, for *practicle*, read *particle*.
Page 79, — 10, for *is*, read *it*.
Page 141, last line, for *principio* read *principii*.

ELEMENTS OF LOGIC.

INTRODUCTION.

No branch of study has suffered so much from perversion and neglect as Logic. Its nature and object have been misunderstood and misrepresented. Writers on the subject, not having defined its peculiar province, or discriminated it from other departments of knowledge, have extended its limits beyond all reasonable bounds. And many, perceiving its inefficiency to accomplish what its votaries promise, have consigned it to contempt or oblivion. To form just views of its nature and object, and to endeavour to rectify the mistakes that have prevailed respecting it, is therefore necessary at the commencement of this study.

It has been disputed, both in ancient and modern times, whether Logic is an Art or a Science. Some have maintained that it is a Science; others, that it is merely an Art:—some, that it is neither; others, that it is both. This, however, is a question of little moment. The terms Art and Science, as used by these opponents, are so indefinite, that Logic may be con-

sidered either, or both, or neither of them exclusively, according to the light in which it is viewed. It is not a mere speculative science which has no connection with practice; nor is it a mere art separated from scientific principles. It is a practical science—a scientific art;—a system that communicates knowledge, not only that we may *know*, but that we may reduce it to practice.

The object of this science is *Reasoning*. By reasoning, in the sense in which it is here used, we understand all the elements of which argumentation is composed. In every act of reasoning a conclusion is drawn from premises, these premises are made up of propositions; and propositions are formed of terms. All of these are constituent parts of an argument; and therefore they all fall within the province of Logic.

It is however the reasoning process, the principles on which it is founded, and the laws by which it is regulated, that form the proper object of Logic. To analyze the mental powers employed in reasoning, and to investigate their phenomena, belongs to the Metaphysician. It is only so far as they are subject to the laws of reasoning that they claim the notice of the Logician. It is his office to analyze the principles by which, in so far as argumentation is concerned, we think, judge, and reason, with precision and accuracy. This science is primarily occupied with the laws of thought restricted as above. But as language is the vehicle of thought, it must necessarily in some degree be conversant with this medi-

um of communication. This, however, is only a secondary object. It is merely because language expresses the thoughts with which Logic is concerned, that it comes under its notice. The philosophy of language belongs to the Grammarian and Rhetorician.

Aristotle has not given a definition of Logic. The first name given to it by Plato was *Dialectics;* because Socrates used the form of a dialogue when disputing with his countrymen. It was also called the *Instrumental Art;* because it was employed by the Peripatetics as an instrument to ascertain all truth. The Epicureans styled it the *Canonic Art;* because they considered it the experimental proof of the soundness of an argument. These names have now been abandoned for the term Logic, which is derived from a Greek word signifying that which pertains to reasoning or drawing conclusions.

Having thus endeavoured to ascertain the nature and object of Logic, and to define and fix its appropriate limits, we shall take a rapid sketch of its history, and attempt to remove the prejudices and errors that abound respecting it.

The earliest writer on Logic was Zeno the Eleatic. His work on this subject was divided into three parts. The first treated of consequences; the second of colloquial argumentation; and the third contained a method of wrangling whereby the disputant might entangle his opponent by sophistical reasoning. Hence

arose the Sophists, who were plentifully furnished with the weapons which this art of wrangling supplied; and who discussed with the greatest eagerness the most obstruse or the most trifling topics. It is probable the Greeks considered this as an ingenious recreation; and had recourse to it merely for amusement, or for the cultivation of their intellectual powers;—though it might be indulged in too much, and was sometimes prostituted to unworthy purposes. With this art however Logic has no concern but to detect and expose its intricate absurdities. Yet the Sophists retained possession of the philosophic schools from the 35th to the 90th Olympiad.

It is only the second part of Zeno's work that properly belongs to Logic. The interrogatory method of disputation which he introduced is founded on strictly logical principles. It was this mode of reasoning that Socrates adopted, who flourished about B. C. 400, and who is justly esteemed one of the most celebrated philosophers of antiquity. Both the manner and the matter of his argumentations did equal honour to his virtues and talent. He frequented the public places of resort, and mingled familiarly with those whom he wished to benefit. He entered into general conversation with them; proposed simple questions; and gradually drew from themselves such concessions as effectually condemned their vices, or exposed their errors. It is from him that the *Socratic Dialogue* derives its name—many valuable specimens of which are preserved in the writings of Xenophon and Plato.

This mode of reasoning, however, was soon perverted. Euclid of Megara, and other disciples of Socrates, devoting themselves to the intricate fallacies of the schools, banished that philosophy to its native skies, which Socrates had brought down to the earth. This was not the case, however, with all his pupils. Among them Plato stands conspicuous; who, to all the other branches of knowledge which he studied and adorned, added an intimate acquaintance with the reasoning art. He has indeed left nothing that expressly treats of Logic; yet he speaks of it in the highest terms of approbation, and by his happy method of philosophical research did much to prepare the way for its clearer developement. About this time rules were invented for defining, and dividing, and classifying our ideas. Yet with regard to reasoning itself, little or nothing was accomplished till the renowned discoverer of the syllogism appeared.

Aristotle was born at Stagira about B. C. 385. He was brought up at the Court of Macedon; was for twenty years the favourite pupil of Plato; and being the tutor of Alexander the Great, was furnished by him with every thing necessary to the successful prosecution of his philosophical inquiries. His masterly genius, and the favourable opportunities he had for improvement, made him the first spirit of his age. He was a man of indefatigable industry, and immense reading; and for nearly two thousand years he exercised as sovereign a dominion over the opinions of man-

kind, as did his royal pupil over their liberties and fortunes.

The writings of this philosopher embrace almost every department of knowledge. It was his Dialectics, however, that gained him his greatest renown. We are indebted to the Stagirite for all the chief principles of the science of reasoning. Some of the materials of the system were indeed prepared before his time, but he laid the foundation; and to this day it remains substantially the same as when he bequeathed it to posterity.

It does not appear that the Logic of Aristotle drew much attention from his contemporaries. At his decease he bequeathed his writings to Theophrastus his pupil and successor. Theophrastus left them to Neleus of Scepsis; who, though not a philosopher himself, was nevertheless highly delighted at possessing so valuable a treasure. At this time the King of Pergamos was collecting Manuscripts for the Alexandrian Library; and Neleus, fearing lest he should be deprived of the writings of the philosopher, concealed them in a cellar, where they remained for upwards of a hundred and thirty years. It is uncertain by whom or in what way they were rescued from their confinement; but it is certain they were in no small degree injured by the damps and the vermin of their dreary habitation. They were afterwards purchased by Apellicon, whose passion for books was insatiable. By him it is supposed they were subjected to so many corrections, and interpolations, as injured them more

then the dungeon in Scepsis. After this they were carried to Rome by the Dictator Sylla. But the reputation of Aristotle was never great among the Romans. Cicero mentions his writings, and says that they deserve to be better known. But the science seems not to have been at all cultivated. In the fifth century of the Christian era Aristotle's Logic was translated into the Latin language by Boethius, "the last sage of the ancient world." But the fall of the Roman Empire introduced the dark ages, when ignorance universally reigned: and we lose all traces of the science till at length light began to dawn in the east among the Saracens and Arabians.

In the East literature flourished from the beginning of the 9th to the close of the 13th century. Al Mamoon, a Saracen Prince, had the works of the Grecian philosophers translated into Syriac and Arabic, and they were diligently studied in the Colleges at Bagdad and Grand Cairo. Amongst them Aristotle soon became a favourite author. His Logic especially was much admired. The syllogism became a noble instrument for explaining and establishing the doctrines of the Koran. This in no small degree contributed to the injury of the science. And when we add that the above mentioned Prince caused the original Manuscripts to be destroyed; and that when the Saracens conquered the west, corrupt translations were introduced and diligently studied, it will not appear wonderful that Logic should have been so corrupted, as it afterwards was, in the idle and violent disputations of the schools.

In the middle ages numerous controversies exercised the ingenuity of the learned. To attain skill in the management of these disputes was the chief object aimed at in a liberal education. That the syllogism might be perverted to aid this species of wrangling was soon perceived. Hence to be able to wield this instrument to advantage, became the chief object of ambition. The disputations were not confined within the walls of colleges. Large public assemblies, consisting of the first beauty, rank, and fashion, met together to witness the contest and applaud the victor. Frequently the conqueror, like a knight errant of chivalry, wandered about in search of Quixotic adventures, challenging every where those who were renowned for syllogistic superiority.

The topics selected for these discussions were worthy of the occasion. We may subjoin a specimen from that department of Natural Theology, which they dignified with the name of Angelography. They gravely discussed, "Whether more than one angel could exist at the same moment of time in the same physical point?" "Whether angels can visibly discern objects in the dark?" or "Whether they can pass from one point of space to another without passing through the intermediate points?" These and similar all-important questions were nobly supported or controverted. The combatants were ranged in opposite parties, and sometimes the violence and acrimony of their disputes rose so high as to endanger the public peace, and call for the interference of the public authorities.

The syllogism being the grand instrument by which these disputes were carried on, and by the skilful management of which victory could only be obtained, was looked upon as the noblest achievement of the human intellect. It was styled the universal organ of science; the eye of intellect; and, like the sun, the light of the world. It was said to be, "ars artium, scientia scientiarum, organum organorum, instrumentum instrumentorum, ancilla, clavis, testa, murus philosophiæ, docendi dicendique magistra, veri falsique disceptatrix et judex." Nor were the praises heaped on the philosopher himself less absurd or extravagant. It was gravely asserted "that Nature was not altogether complete till Aristotle was born; and that in him she received the finishing stroke, and could not advance farther."

The dominion which Aristotle thus gained in literature, and science, and religion too, was most pernicious. What wonder is it then if men of common sense became impatient of the yoke? Was it not to be expected that they would rise, and with one sweeping stroke rid themselves of a system that had been so grossly perverted and abused? This we find actually took place.

In the 15th century a variety of favourable events ushered in the revival of letters—a circumstance of the greatest importance in the history of Logic. When Constantinople was taken in A. D. 1453, many distinguished Greeks took refuge in Italy, and in other parts of Western Europe. By them the writ-

ings of the Greek philosophers were again brought into notice, and the most happy results attended the study of these inimitable productions. The reformation of religion; the discovery of America; the invention of the art of printing, all exerted a favourable influence on the Arts and Sciences. And many persons, in the learned world, arose, who by wit, and argument, and irresistible eloquence, boldly attacked the Author of the syllogism. Erasmus and Luther deserve to be honourably mentioned. The latter renounced the Pope both in religion and philosophy. He thundered against the syllogism with all the vigour of his masculine and intrepid mind: and had it not been for Melanchton he would in all probability have accomplished a complete reformation in the schools. Ramus and Des Cartes in France; and Leibnitz in Germany, followed in the same train. And in England the immortal Lord Bacon did much to emancipate the world from the absurdities of the scholastic philosophy.

The errors into which the schoolmen had fallen, justify the severity with which their system was assailed. But their error lay not in their studying and prizing Logic, but in their utterly mistaking both its nature and object. They either degraded it to a mere instrumental art fitted only for ingenious subtile trifling; or they elevated it to the dignity of being the only instrument necessary for physical investigation, and the discovery of truth. It was against these glaring mistakes, this sad perversion of the system, that the censures of Lord Bacon were principally directed; al-

though the weight of his name is often brought forward to discountenance all Logical pursuits whatever. He had too much wisdom, however, to condemn the legitimate cultivation of any science, because it had been abused. It was the reformation, not the destruction, of the sciences that he laboured to promote; and many passages might be quoted from his treatise *De Augmentis Scientiarum*, in which he commends both Logical studies, and their illustrious author.

After the days of Lord Bacon, one of the most determined opponents of the Aristotelian Logic was Locke, the author of the justly celebrated Essay on the Human Understanding. Whoever has studied Logic and reads his remarks, will perceive that they are founded on mistake; a circumstance pardonable perhaps, even in so great a mind, when we consider how much logicians themselves have been chargeable with the same error. His objections to the science, having often been repeated from his time to the present day, merit our attention.

He condemns the syllogism as not being "the only proper instrument of reason in the discovery of truth." We grant it; but what then? Must Chemistry be condemned because it does not impart skill in the Mathematics? Is the science of Optics destitute of utility because it leaves us in ignorance respecting the formation of the earth? The proper instruments for the discovery of truth, and the enlargement of our knowledge, are undoubtedly observation and experiment, so admirably brought to bear on the study of

nature in the Inductive Philosophy. But the province of Logic is quite distinct from this. It is occupied exclusively with Reasoning. And surely it is no valid objection to one science that it does not accomplish that which is the object of another.

Locke objects to this science too as being a peculiar "way of reasoning," intended to be substituted for the common ordinary method of argumentation. But it is not a peculiar method of reasoning, which may or may not be adopted at pleasure. All correct reasoning is logical. It never was the intention of Logic to introduce the syllogism expressed at full length into our ordinary discussions, this would be equally absurd as to encumber every step of a mathematical process by writing, at full length, the axiom or proposition on which the proof depends; or to say, "that to speak grammatically, means to parse every sentence we utter." Hence all that Locke says respecting the "simple and natural disposition" of ordinary reasoning, and the "perplexed repetitions and jumble" of syllogistic, reasoning is irrelevant. All reasoning must be syllogistic, if it is reasoning at all; though not necessarily expressed in the form of a regular syllogism. Even the Socratic Dialogue, than which reasoning cannot adopt a more simple, flowing, or popular form, is strictly syllogistical, being a hypothetical *Sorites*, which can easily be reduced to a series of regular syllogisms. In short Logic does not introduce the syllogism as a mode of reasoning distinct from, and intended to supersede, any other mode; but as the

form to which all correct reasoning may be reduced, and by which its validity may be ascertained.

Another argument which Locke brings against this science is, "that there are many men who reason exceedingly clear and rightly, who know not how to make a syllogism." This statement is frequently brought forward at the present day, as justifying the neglect of logical studies. But is scientific knowledge of no use to the practical mechanic, though without it he may perform his work with considerable dexterity? Does the musician act wisely who neglects the rules of his art, and trusts merely to his taste, and natural abilities, and acquired habits, for reaching eminence in his profession? Assuredly not. A system of rules, drawn from a scientific acquaintance with his profession, is considered necessary by every one. And he that would trust in this respect to practical wisdom, or common sense, or mere unaided experience, to the exclusion of systematic knowledge, would be a fit object for ridicule or pity. Why then should scientific knowledge be considered unnecessary respecting Reasoning, which has been justly styled the appropriate intellectual occupation of Man? Is it of no use to be able to resolve an argument into its elements; to understand the theory on which it rests; to be acquainted with the rules by which it is constructed; and to learn to do that *well* which must be done constantly every day of our lives? In the application of these principles there will still be enough left for good sense, and natural talent to accomplish.

But an acquaintance with these principles must materially aid both our skill and confidence when engaged in argumentation.

Even admitting that little practical benefit resulted from this study, it would not follow that it should be consigned to neglect and oblivion. Knowledge is valuable for its own sake. The exercise of the mental powers on any subject contributes to their improvement. If we venerate the relics of antiquity; if the achievements of genius demand our admiration and regard; surely that which swayed the learned world for ages deserves to be studied, were it nothing but a literary curiosity.

The next writer on this subject who claims our notice is Watts. But Logic has not been more unfortunate in its avowed enemies, than it has been in its professed friends. Hence even the treatise of Watts, which has attained so great celebrity, has done much to injure this study. He appears to have been misled by the specious arguments of Locke against the syllogism. Locke ridicules the idea (as well he might) that God had merely made men "two-legged creatures, and left it to Aristotle to make them rational." Dr. Watts easily perceived that the Aristotelian Logic was insufficient for this vast achievement. But he seems not to have detected the fallacy that lurks in this Philosopher's reasoning. Hence instead of shewing that it was neither the province nor object of Logic to make men reasonable, he has endeavoured to raise it to this dig-

nity by constructing a system denominated *The Right use of Reason*, which is to improve all the intellectual powers of man, and assist us both in searching after truth, and communicating it to others. "The design of Logic," he says, "is to teach us the right use of our reason, or intellectual powers, and the improvement of them in ourselves and others." Surely this is an object too vast to be accomplished by any *one* science. It is the end which the whole circle of the sciences aim to effect by their united efforts. To claim it, then, as the peculiar province of Logic, is to raise expectations which can never be realized, and to bring the study into unmerited neglect. The rules which Watts has laid down respecting ideas, and prejudices, and rules of judgment, may all be very important and useful; and in some respects they may be connected with our science. But it is not the object of Logic to teach us to acquire a treasure of ideas; to remove all sources of prejudices and error; and to give us complete certainty respecting the truth or falsity of every proposition. No system of rules can effect this. While the human mind remains as it is, and the sources of error are so multiplied around us, no combination of scientific principles can enable us to judge and reason aright with absolute certainty on every subject. To represent Logic as being a system of universal knowledge fitted to accomplish this end—as being a *panacea* for all the defects and errors of the mind, is certainly giving an erroneous view of the subject. Yet this idea pervades the whole of Dr. Watts' treatise.

Errors in reasoning may spring from two distinct sources; either from the *subject* about which we are reasoning, or from the *manner* in which the process is conducted. Now it ought to be particularly remembered that it is only the *latter* with which Logic is concerned. It may be applied to all branches of human knowledge; but its object is not to decide on the truth or falsity, the correctness or incorrectness, of the statements made, but to see that the inferences drawn from them be strictly correct. If the premises be true, the conclusion, if logically deduced, will be true likewise. If the premises are false, the conclusion may be logically correct, although in reality it may be an erroneous statement. If no error is suffered to take place between the statements made and the inferences drawn from them, Logic has accomplished its work, whether these statements be true, or whether they be false.

That the chief sources of error spring from the subject matter, not from the process of reasoning, is abundantly evident. Hence many ingenious writers, since the days of Watts, have treated Logic with contempt, because it removes not the greatest hinderance to our attaining real truth and certainty in our argumentations. But is it fair to condemn a science because it does not accomplish impossibilities? All that comes within its own province it is able to do well. No more is expected from any other science. Why should it be insufficient in respect of Logic? Chemistry is not censured because it does not provide the substances which it analyzes and

combines; or because these substances are not all simple and unadulterated. When they are presented to the Chemist, his work begins; and his object is accomplished when, by analysis or synthesis, he produces the simple or compound substance into which they may be resolved or combined. So all reasoning must be founded on knowledge,—on facts either true or false. With the acquisition of this knowledge, or with the truth or falsity of these facts, considered as such, Logic has nothing to do. All these must be provided for in the various ways by which man gains knowledge and understanding. This knowledge, when acquired, the Logician operates upon. When it is presented to him he combines and analyzes it, according to the rules of his art, or the principles of his science, and draws such inferences from it as it really and properly warrants. If any *unsound mode of arguing* creeps into the reasoning process, any "ingenious mixture of truth and falsehood, so entangled,—so intimately blended,—that the falsehood is (in the chemical phrase) *held in solution:* one drop of sound Logic is that test which immediately disunites them, makes the foreign substance visible, and precipitates it to the bottom." This is the proper province of Logic. If it is fitted to gain this end, surely it is of sufficient importance to preserve it from neglect, although it may not be able to put us in possession of universal truth,—with less than which, however, its opponents seem unwilling to be satisfied.

We rejoice that Logic, after having been vastly

overrated by some, and unjustly undervalued by others, is now, at the present day, beginning to be appreciated according to its real merits and importance. The strictly scientific character of the system has been demonstrated, by shewing that the process can be carried on by arbitrary symbols, without any regard whatever to the signification of the terms; the peculiar province of the science has been recognised and fixed, so that writers on this subject, instead of wandering through every field of science, may now confine themselves to their proper home; the extravagant expectations raised by the unwise exaggerations of its friends, have sunk down within something like reasonable limits; and even the deep-rooted prejudices of its enemies, are beginning to disappear. One of the principal writers at the present day, to whom these happy results are to be attributed, is Dr. Whately, Archbishop of Dublin. His admirable work on this subject has done much to rescue the science from neglect and misrepresentation; and has given a new life and direction to the study, that must be beneficial. The arrangement of Dr. Whately's *Elements* is perhaps deficient in that lucid order so necessary in such pursuits—especially to those who are only beginning their logical studies; and in the details and principles of the work the severe critic may perhaps detect some trivial deficiencies and errors. It is a work, however, of unquestioned merit, of which the freest use has been made in the following pages. In this short treatise, the chief aim has been to give a clear and concise view of

the science, and to furnish a convenient Compendium of Logic for Schools and Colleges in India. Whatever, therefore, has appeared valuable in former writers has been without scruple adopted. Much has been accomplished by those who have preceded; but the very appearance of this little work, shews, that, in the estimation of the Compiler at least, something was still needed, to guide the youthful student in his logical pursuits. Whether this has now been supplied, must be left to others to determine.

It is not to be expected, indeed, that this study will soon become popular. Here there is little to please the taste, fill the imagination, or strike the senses. The beauties of Poetry, the sublime wonders of Astronomy, and the striking experiments of Chemistry, invest these studies with a fascination which few can resist. But Logic treats of what is common and familiar to all. Few have any curiosity to know what it is, or what it proposes to accomplish; while many suppose they are in possession of all its advantages already, without being indebted to its aid. We doubt not, however, but that this study, when better known, and cultivated on right principles, will gradually rise in reputation. To understand the theory of Reasoning, the principles on which it is founded, and the rules to which it has been reduced, is an object worthy the attention of every human being. The advantages to be derived from a study embracing these particulars ought to recommend it as an essential part of a liberal education.

ELEMENTS OF LOGIC.

OF THE OPERATIONS OF THE MIND.

In every process of argumentation there are three operations of the mind called into exercise; Simple Apprehension, Judgment, and Reasoning. By *Simple Apprehension* we gain our notions or ideas: by *Judgment* we compare our ideas together, and pronounce on their agreement, or disagreement; by *Reasoning* we proceed from one decision to another on which it is founded, or from which it may be derived.

To analyze these processes, and investigate their phenomena in so far as they are purely *mental* exercises, belongs to another department of science. It is only as they are employed in reasoning that they come within the province of Logic. An act of simple apprehension embodied in language is called a *term;* an act of judgment when expressed, is called a *proposition;* and an act of reasoning, an *argument.* Logic is therefore, divided into three parts, sometimes denominated after the three operations of the intellect referred to above. The first treats of Terms, the second of Propositions; the third of Arguments.

PART I.

OF TERMS.

The first part of Logic treats of *terms*. Terms may be confused, indistinct, and inadequate. Logic endeavours to remove this obscurity, and to give them a clear and determinate meaning, by rules of *Distinction, Classification, Division*, and *Definition*. These have been called *Logical instruments;* it is only to the last two, however, that this title peculiarly belongs.

CHAP. I.

OF DISTINCTION.

Errors in reasoning frequently spring from our not properly distinguishing things that are different. Distinctions, then, if founded in truth, may be of great use in keeping us from mistake, and in assisting us to detect error. Some distinctions are *verbal*, others are *real*. As an example of the former the word 'cause" may be selected. Properly speaking there is but *one* cause—the self-originated fountain of all being. The term, however, is frequently applied to animate and inanimate objects, only adding the word "secondary" to qualify the expression. There are also other distinctions in reference to causes. Among

these the most important are, the efficient cause, the material cause, the formal cause, and the final cause. The "efficient cause" is that from which the effect proceeds. The "material cause" is that of which it is produced. The "formal cause" is the manner in which it is accomplished. And the "final cause" is the object intended to be achieved. Verbal distinctions however more properly belong to Grammar than to Logic.

Distinctions that are *real* are those that retain their signification into whatever language they may be translated. Of these there are many in common use, which, though not exclusively belonging to the science of reasoning, may here be mentioned. A number of the usual divisions of words given in works on Logic, are not so much divisions of the words themselves, as of the manner in which they are employed. This is the case with *univocal, equivocal,* and *analogous* terms. They are not distinct classes of nouns, but the same term used in either signification according to the pleasure of the writer. Thus the term "house" may be considered *univocal,* because it is only applicable in the same sense to one kind of object. But it may be used also so as to give it a different meaning every time it is employed; and then it would properly be called *equivocal.* When two objects have a certain resemblance or analogy to each other, they are often called by the same name. Thus a "blade of grass," and a "blade of a sword" resemble each other. In this case then the term is called *analogous.* But all these are not distinctions in the terms themselves, but only in the manner of using them.

Terms in which a real distinction obtains have been arranged into the following classes.

1. *Singular and Common terms.* A *singular* term denotes one object considered as an individual existence; as, "Alexander the great," "the City of Paris," "this tree," "that river." These terms cannot be said *affirmatively* of any thing but themselves. A *common* term stands for several individuals called its *significates*, and may be affirmed of all comprehended in the class to which it belongs. Thus, "man," "city," "tree," "river," may be affirmed of any object included in these classes. As, "Pompey and Cæsar were men," "Paris, London, and Calcutta, are cities." "The Euphrates, the Tigris, the Indus, and the Ganges are rivers."

2. *Absolute and Relative terms.* An object viewed as a whole without any reference to another with which it may be connected, is denoted by an *absolute* term; as, "a man," "a living creature," "a human being." A *relative* term expresses an object considered as a part of a whole, viewed in reference to that complex object. Thus, "Teacher," "Scholar," "Master," "Servant," are relative terms, because they are each a part of the complex objects, "Teacher-and-scholar," "Master-and-servant." When objects are related to each other, and viewed in reference to that relation, they are expressed by *Correlative terms.* Thus, "Father and Son," "King and Subject," "Master and Servant," are correlative. But "King and Servant," "Father and Subject" are not correlative

terms, although the *servant* may be the *subject* of the king, and the *subject* may be the *son* of the father.

3. *Opposite and Compatible terms.* When there are two views of a single object which cannot be taken at the same time, this is expressed by *opposite* terms. When both views may be taken of the same object at the same time, this is denoted by *compatible* or consistent terms. Thus "hard and soft," "cold and hot," "black and white," are *opposite* terms. But "hard and cold," "white and soft," are *compatible* terms.

4. *Abstract and Concrete terms.* An *abstract* term expresses an object without any reference to the subject in which it exists. As, "wisdom," "folly," "poverty," "riches." When an idea is expressed in conjunction with the object to which it refers, it is expressed by a *concrete* term. As, "wise," "foolish," "poor," "rich."

5. *Positive and Negative terms.* A *positive* term expresses a certain view of a subject actually taken of it; as, "a man *speaking*," "a bird *flying*." When this view *cannot* be taken of the object, it is denoted by a negative term; as, "dumb," "motionless." When a certain view of a subject *might* be taken of it, but *is* not, this is expressed by a *privative* term; as, "a man silent," "a person not walking."

6. *Definite and Indefinite terms.* A privative or negative term, since it does not define and mark out an object, is called an *indefinite* term. But the positive because, it does define and limit our view of an

object, is called *definite*. Thus, "a living creature," "a lion," "a lion roaring," are definite terms, because they mark out a particular class of beings, or a particular individual, or a single individual in a particular mode. But, "not a living creature," "not a lion," are *indefinite*, because they do not restrict our view to any class or individual. They merely exclude *one*, and leave all the rest undetermined.

7. *Contradictory and contrary terms.* When two terms are opposed to each other, the one having, and the other wanting, the negative practicle *not*, either expressed or understood, these are called *contradictory* terms. Thus, "a living creature," and "not a living creature," "a lion," and "not a lion." It is impossible that any thing can be *both* these at the same time, and it is impossible also but that every thing must either be one of them or the other. Nothing can at the same time be both "a living creature," and "not a living creature," but every thing that is conceivable must be one of them. In this way a perfect division of any subject may be made. But *contrary* terms are merely those that are the most opposite of that class to which they belong. Thus "rich" and "poor," are *contrary* terms. They cannot be applied to the same object at the same time; but there are many persons to whom *neither* are applicable.

CHAP. II.

OF CLASSIFICATION.

Under this head the ancient Logic treated of the ten *Categories*, and the five *Predicables*. The categories were given as a complete enumeration of every thing that can be expressed without composition and structure. They were intended to include all the possible objects of thought, knowledge, or discourse, and were supposed to be of special use in assisting the disputant to find middle terms. A regular distribution of things under proper heads is a great help both to the memory and the judgment; and the invention of a classification of this kind, which the speculative part of mankind acquiesced in for two thousand years, is a proof no doubt of superiority of genius which is seldom to be found. But that which was here attempted exceeded the reach of human power. The ten categories have therefore long been abandoned as of no practical utility. It will be sufficient, then, merely to mention them. They were *Substantia*, *Quantitas*, *Qualitas*, *Relatio*, *Actio*, and *Passio*;—these were considered of special use: the other four, *Ubi*, *Quando*, *Situs*, and *Habitus*, were reckoned of less importance. We may remark, however, that no general classification of the objects of thought, that has been substituted in the place of the ten categories, has, to the present day, been found more perfect.

The *Predicables*, however, have maintained their

authority to the present time. Of these therefore a more extended account is necessary.

A term which can be affirmed of several others has been called a *Predicable*. It must be evident that whatever is affirmatively predicated of another must express some relation that it bears to that object. It must point out, either its whole essence, which is called its *species*; or the material part of it, which is called its *genus*; or its distinguishing characteristic, which is called its *differentia*; or something joined to its essence, either separable or inseparable, which is called its *property* or *accident*. This has given rise to the doctrine of the five *universals*, or *predicables*; to wit, *Genus*, *Species*, *Differentia*, *Proprium*, and *Accidens*.

The *Genus* is the highest or most universal class, which includes two or more species. Thus, "animal" is a genus including "man," "beast," and all classes of living creatures.

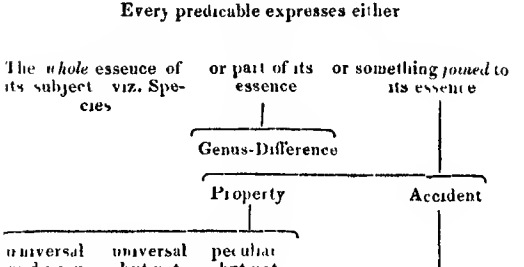
The *Species* is a class comprehended under a higher class, and is composed of individuals. Thus, "Peter," "John," "Thomas," and all the individuals of the human race, are included in the species "man."

The *Differentia* is that which distinguishes one species from another; or it is an essential attribute which belongs to the species, but not to the genus. Thus "reason" is the differentia of man, because it distinguishes the species "man," from the species "brute:" or because it is a characteristic that belongs to the species "man," but not to the genus "animal."

The *Proprium* is some property peculiar to a species, belonging to the whole of it, to it alone, and to it always, yet not constituting its distinguishing property. Thus "risibility" is the proprium of man; it belongs to the whole species, to this species only, and to it at all times; yet it does not constitute its distinguishing property, for it is less essential to man than rationality. Some of these properties belong to the *whole* of a species, but are not *peculiar* to it; as, "to breathe air," belongs to *every* man, but not to man *alone:* other properties are *peculiar* to a species, but do not belong to the *whole* of it; thus, man *alone* can be a poet, but it is not *every* man that is so. These properties, however, are more properly reckoned *accidents.*

The *Accidens* is an attribute not essential to the species, which may or may not be absent without destroying its nature. Thus, "hot" or "cold;" "rich" or "poor;" "a native of India;" "a native of London," are all accidents; because whether absent or present the essence of the species remains the same. Those accidents that can be separated from the individual are called *separable* accidents; those which cannot be separated are called *inseparable.* A man that is poor may become rich; "poverty," therefore, is a *separable* accident. He that is a native of England can never be otherwise in that respect; "a native of England," then, is an *inseparable* accident.

The above may be illustrated by the following Table.



The genus and difference make up the Species, thus, "rational," and "animal," constitute "man." When therefore the genus is spoken of as a *whole*, and said to *contain* the species, this is only a metaphorical expression, signifying that it has a more extensive signification; thus, "man" is a more full expression than "animal:" but "animal" is more *extensive* than man, because it can be predicated of several other species. In the same way the name of a *species* is more *extensive*, but less *full*, than that of an *individual*.

A genus may be either a *summum*, or a *subaltern* genus. It is the former when it has no genus above it, or when it cannot be considered a species of any higher class. Thus, "substance" is a *summum genus*, because it is not a species of any higher genus. A

subaltern genus is both a species of a higher genus, and a genus in reference to the species into which it may be divided. Thus, "animal" is a subaltern genus, because it is included under the higher genus "substance;" and at the same time it is the genus of "man," "bird," and every species of living creatures. That genus which is the *nearest* that can be predicated of a species is called its *proximum genus;* thus, "juice," is the proximum genus of wine; "liquid," is its more remote genus. A species which has under it only *individuals*, and which cannot be considered a genus, because including no species, is called an *infima species.*

Of these predicables some are more universal than others; and this gave rise to what is taught in Logic respecting the *extension* and the *comprehension* of a term. By the former is meant the number of individuals of which the term may be predicated. The latter signifies all the simple ideas which united constitute what the term denotes. Thus, the term "bird" is applicable to every individual of all the various species of the feathered tribe. This, then, is the *extension* of the term. On the other hand the same term "bird" may be considered as including the idea of life, sensation, spontaneous motion, the possession of wings, a covering of feathers, and all the properties belonging to this class of living creatures. These ideas united give us the *comprehension* of the term. By attending to this distinction the logical rule will appear evident, that *the greater the extension, the less the comprehen-*

sion of a term; and the greater the comprehension, the less the extension. The term "animal" has a greater extension than "man," because it can be predicated of "man," "beast," "bird," and all living creatures. But "man" is more comprehensive than "animal," because it includes not only all that the term *animal* does, but all that peculiarly belongs to the rational animal *man*. In the same way the name of an individual is more comprehensive than the name of a species, but its extension is evidently less. "Pompey" can be predicated only of an individual, but it includes, besides all that belongs to the species, every thing that is peculiar to that individual.

CHAP. III.

OF DIVISION.

Nothing is more fitted to give us clear, distinct, and accurate ideas of a complex object, than to reduce it to its component parts. For this purpose division was invented. In its proper acceptation it means actually to separate the parts of which any thing is composed; and each of these parts thus physically divided must of course be absolutely less than the whole. This is not the case, however, in a logical division. Division, as employed in Logic, is a metaphorical expression, signifying the separate enumeration of several things expressed by one common term. The several parts

which compose the whole are here only enumerated; and each of the members comprehends *more* than the whole. A tree may be divided physically into root, trunk, branches, and leaves; and each of these members must be less than the whole tree. But if we divide logically a genus into its species, each of these species comprehends more than the genus; for it expresses not only the general notion of the genus, but its own peculiar characteristic which makes it a species. Thus, if the genus "tree" be divided logically into several species, as oak, elm, ash, and so on: the word *oak*, or *elm*, or *ash*, comprehends not only the general notion of a tree, but also that difference which belongs to that particular kind of tree. Care, therefore, must be taken not to confound a physical with a logical division, otherwise the rules that have been laid down for a good division will be misapprehended.

Logical division is the distribution of a whole into its several parts. If it be a genus it must be distributed into its species; if it be a species, into its individuals; if it is an individual, it is incapable of logical division, because it is strictly speaking only one object. The several partitions into which a whole is distributed are called the *parts* or members of the division. If our distribution be happy, it will greatly contribute to our gaining a complete knowledge of the thing divided; and for this purpose the following rules for division have been laid down.

1. *Each of the parts, or any number of them short of all, must have a narrower signification than the thing divided.* Thus, "mineral" may be divided into "stones," "metals," and so on; and "metals" again into "gold," "silver," "iron," because each of these, and any of them short of all, contain less than the thing divided.

2. *All the parts together must contain neither more nor less than the whole.* Thus, "medicine" has been divided into the "art of preserving health," and the "art of restoring health;" because there is no other kind of medicine besides these two. Every thing that can be even conceived of must either be "corporeal," or "incorporeal." In this way a complete two-fold division may be made of any subject so as to *exhaust it*, that is, to make the division adequate to the subject divided. To divide "metals" merely into "gold and silver," would be an imperfect division, because these parts together do not make up the whole.

3. *The parts must be opposed, not contained in each other.* If "book" were divided into "poetical, historical, folio, quarto, French, Latin," the parts would be contained in each other; because a poetical book might be a folio; a quarto, French; and an historical book, Latin. Men may be divided into "rich and poor," or "young and old," or "learned and illiterate;" because these classes are opposed to each other.

4. *The natural order should be preserved in arranging the several members.* Thus, "animal" may

be divided into "man," "beast," "bird," "fish," "insect;" but were we to reverse, or disarrange this order, our enumeration would be faulty, because a subject should be distributed into its proximate and nearest members.

5. *When an object can be divided in several ways, we should select the one most suitable for our purpose.* Thus, "mankind" may be divided politically according to their civil character, as Lawyer, Merchant, Tradesman; or physiologically, as Negro, Mulatto, White-man; or geographically, as European, African, American; or theologically, as Christian or Pagan, Heathen or Mahometan. We must therefore determine at the commencement which principle of division will most suit our purpose, and adopt it in preference to all others.

CHAP. IV.

OF DEFINITION.

Definition literally signifies, "laying down a boundary." In Logic it is used in a metaphorical sense to signify "an expression which explains any term, so as to separate it from every thing else." It must be particularly remarked, however, that the object of a logical definition is not to give an adequate conception of the nature and essence of the object defined. This is in most cases impossible, from the limited nature of

our present powers. Its chief use is to see that a term shall not be used in different senses in any process of reasoning. Of course if there be no ambiguity in a term, there is no need to define it; but in those cases where definition is needed, the greatest assistance may be obtained from the rules which are laid down on this subject.

In a logical definition every thing essential to the thing defined must be contained. This includes, first, what is common to it with other things of the same kind; and secondly, that which distinguishes it from other things of the same kind:—in other words, its *genus* and its *differentia*. There are various kinds of definition, however, which must be clearly distinguished, otherwise we shall fall into confusion and error. Of these the following may be mentioned.

1. *A Nominal Definition.* This has been called the *definition of the name*, and is merely the explaining the meaning of a term that is not clearly understood, by giving an equivalent expression which happens to be better known. Thus, "Geography" may be defined, "a description of the surface of the earth;" "decalogue," the "ten commandments;" a "triangle," "that which has three angles." These definitions are usually found in dictionaries.

2. *An Essential Definition.* This has been called by logicians the *definition of the thing*, and explains an object by pointing out its essential attributes. Thus, if called to define what the mathematicians call a square, we should say, "a square is a figure which

has four equal sides, and four right angles." A circle, we should say, "is a plane figure contained by one line, which is called the circumference, and is such that all straight lines drawn from a certain point within the figure to the circumference are equal to one another." This kind of definition belongs to the science that is employed about the particular object defined; and it is to be remarked, that in mathematics the Nominal and Essential Definition exactly coincide—the meaning of the word, and the nature of the thing, are exactly the same. This is the case also in the definition of most scientific terms.

3. *A Logical Definition.* This kind of definition consists of two parts; the first part points out those objects with which the thing to be defined essentially agrees; the second part points out those qualities which are peculiar to itself, and which distinguish it from all others:—in other words, a logical definition consists of the *genus* and *differentia* of the object defined. Thus, Logic may be defined "the science of reasoning." The first part of this logical definition points out the *genus* to which Logic belongs—it is a *science;* the second expresses its *specific difference*, or that which distinguishes it from all the other species included in that genus—it is employed about *reasoning*. "Wine is the juice of the grape;" "man is a rational animal:" "a flower is an organized being destitute of sensation;" in all these cases the object is logically defined by specifying the genus and the differentia.

4. *An Accidental Definition.* By this is meant a *description*, or as it is sometimes called, an *imperfect* definition, which is merely an enumeration of the accidental properties belonging to the object which we wish to define. A "landscape" may be described as containing corn-fields and meadows, hills and dales, running streams and lakes, villages, houses, and animals, all situated in such a manner as to distinguish it from other landscapes. In a description, however, it is only the *non-essential* attributes of the object that you enumerate. In the above example none of the particulars mentioned are essential to the existence of the landscape. They are necessary to distinguish it from other objects of the same kind; yet it would continue to be a landscape were any of them taken away. They are mere *accidental* properties, which may, or may not, belong to it. In this way alone *individuals* can be defined. We must enumerate the accidents which distinguish one individual from another, and add the *species*, and then they are accurately described; thus, "Philip was a *man* of Macedon, who subdued Greece." This kind of imperfect definition is resorted to when we cannot point out the *essential difference* of that which we wish to define. We collect its chief properties, and by enumerating them endeavour to communicate such an idea of it as may serve to distinguish it from all other objects. Thus "silver" may be described as "white, hard, ductile, fusible, and next in weight to gold." In describing a *species* in this manner, nothing that is merely an *accident*

must be mentioned, because if it does not belong to the *whole* of the species, it cannot clearly distinguish it from others. But in describing an *individual*, the *accidents* only can be enumerated, because it is by them that one individual differs from another. It must be observed, however, that the *differentia* is not always one quality, but is frequently made up of many, no one of which *alone* is sufficient to distinguish the object from all others. In this case a logical definition may be given which may seem to differ very little from a mere description. Thus, if it is said, "silver is white, hard, ductile, fusible, and next in weight to gold," this is merely a description; but if we say, "silver is a *metal*, white, hard, ductile," and so on, this is a logical definition; for we have here the *genus* "metal," and the *differentia*, made up of the several qualities enumerated.

The principal rules for definition are the following:

1. *A definition must be adequate.* By this is meant that it must neither be too extensive, nor too narrow, for the thing defined. Thus, if "insect" were defined, "an animal that flies," this would in one sense be too extensive, because it is applicable to birds as well as to insects; in another sense it would be too narrow, because there are many insects that only creep. But "wine" may be defined, "the juice of the grape;" because this can be affirmed of no other substance, and yet it applies to all proper kinds of wine. When a definition is thus adequate, it is reciprocal with the thing defined, and they may be mutually affirmed of

or substituted for each other. Thus we may say, "the juice of the grape is wine," or "wine is the juice of the grape."

2. *A definition must be clearer than the thing defined.* It must be expressed in language as plain and simple as the subject will allow. It may happen indeed that the term defined is to some persons more familiar than the definition given; but nothing doubtful or difficult should be admitted into a definition, so that it may be generally and easily understood.

3. *It should be expressed in as few appropriate words as possible.* Too great brevity is not to be sought after, because in this case the subject may not be pointed out with sufficient definiteness; on the other hand prolixity must be guarded against, as this would confuse the mind. Doubtful and equivocal, obscure and synonymous terms ought also, for the same reason, to be avoided. In a perfect definition we should not indulge in figurative and metaphorical language, as this might lead to indistinctness and ambiguity. But in an imperfect definition, or description, figurative language may be very properly introduced.

ELEMENTS OF LOGIC.

PART II.

OF JUDGMENT.

THE second mental operation employed in reasoning is *Judgment*, which is the comparing in the mind any two ideas, whether complex or incomplex, and pronouncing whether they agree or disagree. Judgment is that faculty of the mind by which we carry on this process; and when the decision which is thus formed is expressed in words it is called an enunciation, or a *proposition*. Under this head, then, Logic treats of the doctrine of propositions.

CHAP. I.

OF PROPOSITIONS.

A Proposition defined logically is "a sentence indicative," that is, a sentence either affirming or denying; "sentence" is the *genus*, and "indicative" the *difference*. This definition expresses the two parts of a

proposition which cannot be separated from each other except in the mind. But it may be perhaps more clearly pointed out by mentioning its real parts which are actually separable. A proposition consists, then, of a *subject*, a *predicate*, and a *copula*. The *subject* is that respecting which any thing is affirmed or denied; the *predicate* is that which is affirmed or denied of the subject; and the *copula* is some part of the substantive verb "to be," expressed or understood, connecting the subject and the predicate together. Thus, "life is short," is a proposition, in which, "life" is the subject; "short," the predicate; and "is," the copula. It is not necessary, however, that each of these terms should be separately expressed; the same proposition may, in some languages, be expressed by one, two, or three terms; thus, "vivo," "Ego vivo," or "Ego sum vivens," all express the same proposition. "The mind thinks," is a complete proposition, although the copula be not expressed, for it is equivalent to "the mind is thinking:" "I live," signifies, "I am living:" "Troy was," means, "Troy was existing:" "I am," that is, "I am living." In all these cases the subject, predicate, and copula, are contained in the proposition, and are easily found out by expressing the proposition at length. Generally speaking, when the proposition is fully expressed, the subject stands first, and the predicate last in a sentence; but this is not necessary; nor are they to be distinguished from each other by the place they occupy in the sentence, but by carefully marking the import of

the expressions, and the design of the speaker. Thus, in the proposition, "Great is Diana of the Ephesians," the predicate "Great" stands first, and the subject "Diana of the Ephesians," comes last in the sentence. "It is proper to study Logic;" here the subject stands last, and the predicate first, as may be seen by expressing the proposition in the more usual way; thus, "to study Logic is proper." The properties of these propositions merit particular attention. We shall first consider the classes into which they have been arranged, and then notice their important affections or relations.

CHAP II.

OF THE CLASSES OF PROPOSITIONS.

1. Propositions are either *categorical* or *hypothetical*. A proposition may be expressed either *absolutely*, or under a *hypothesis;* and on this distinction the above division is founded. Thus, "Cæsar deserved death;" "Crassus was rich;" "Solomon was wise:" all these are *categorical* propositions, because they express the truth they contain in an absolute, unconditional form. But, "If Cæsar was a tyrant, he deserved death;" "If Crassus was rich, his temptations to pride were numerous;" "if Solomon was wise, his instructions should be regarded:" these are *hypothetical* propositions, because they are expressed in a conditional form, or in a hypothesis.

2. Propositions are either *pure* or *modal*. When a proposition asserts simply or purely that the subject does or does not agree with the predicate, it is called a *pure* proposition. But when it includes also the *mode* or manner in which the predicate is connected with the subject, it is called a *modal* proposition. Thus, "Brutus killed Cæsar," is a pure proposition; but, "Brutus killed Cæsar *justly*," is modal. "Intemperance will induce disease," is pure; "intemperance will *probably* induce disease," is modal.

3. With regard to their *matter*, propositions must either *be true or false*. When the terms in which it is expressed agree with the thing signified, the proposition is *true;* when they do not agree, it is *false*. Hence a proposition must not be *ambiguous*, for in that case it has more than one meaning, and is in reality not one proposition but several; nor must it be *imperfect* or *ungrammatical*, for such an expression has no meaning at all. When a proposition is properly expressed, it is impossible it can be both true and false at the same time, and in the same sense; yet two propositions, though both true, may seem to contradict one another, when used in different senses, or in different respects. Thus, *man* may be said to be both "mortal" and "immortal;" applying the one to his body, the other to his soul. Many seeming contradictions may be in this way explained.

4. With regard to their *quality*, propositions must either be *affirmative or negative*. They are *affirmative* when the predicate is said to agree with the subject;

thus, "man is an animal." They are *negative* when the predicate and subject do not agree; thus, "man is not a tree." An affirmative proposition may be known also by its *copula* being affirmative; thus, "man is mortal;" "not to advance is to go back:" a negative proposition on the contrary is one whose copula is negative; as, "man is not perfect," "no man is innocent."

5. In respect of *quantity*, propositions are *universal* or *particular*. When the predicate is affirmed or denied of the whole of the subject, the proposition is *universal:* when it is affirmed or denied only of a part of it, it is *particular;* thus, "all circles are figures;" Ireland is an island;" "no tyrant is happy," are *universal* propositions; and their subjects are said to be *distributed*, that is, each of them is understood to stand for the *whole* of its significates: but, "some figures are squares;" "some islands are fertile;" "all men are not just;" are *particular* propositions; their subjects are not distributed, being understood to stand only for a part of their significates. *Universal* propositions are generally denoted by the words, "all," "none," "every;" and *particular* propositions by "some," "many," "a few," and so on.

6. When the subject of a proposition is a common term, without any of the universal, or particular signs expressed with it, the proposition is called *indefinite;* and the *quantity* of the proposition must be ascertained by the *matter* of it, or in other words, by the nature of the connection between the extremes.

This may be either *necessary*, or *impossible*, or *contingent*. If the matter of an indefinite proposition be *necessary* or *impossible*, the proposition is understood as a *universal*; thus, "birds have wings," that is, "all birds have wings:" in this case the connection between the extremes is *necessary*. "Birds are not quadrupeds:" in this instance the connection is *impossible*, and therefore the subject is distributed; that is, it asserts that "*no* bird is a quadruped." In *contingent* matter, where the terms may or may not agree, an *indefinite* proposition is understood as a *particular*; thus, "food is necessary to life," that is, *some* food; "birds sing," that is, *some* birds sing; "animals are not quadrupeds," that is, *all* animals are not, or *some* are not quadrupeds.

7. Another class of propositions are those denominated *singular* propositions. Those whose subject is either a *proper name*, or a common term with a *singular* sign, are thus called; and they are considered universals, because in them we speak of the *whole* of the subject. When we say, "Plato was a philosopher," we mean the whole of Plato. If any qualifying term is inserted to indicate that the whole of the subject is *not* to be included, the proposition may be viewed as *particular*; thus, "this man is not *wholly* a philosopher;" "Cæsar was not *altogether* a tyrant;" "I shall not *wholly* die." Singular propositions, however, are most naturally accounted universals:—it is only, when modified as above that they can be contradicted.

Of all these divisions the most important are those which class propositions into *affirmative* or *negative*, *universal* or *particular*; because, considered as to their quality and quantity, every pure categorical proposition must be included in these divisions. Every proposition is either *affirmative* or *negative*; and must either be *universal* or *particular*; they are therefore ranged under four great classes, viz. *Universal Affirmatives, and Universal Negatives; Particular Affirmatives, and Particular Negatives.* These are denoted, for the sake of brevity, by the symbols, A, E, I, O: thus, A, denotes a universal affirmative; E, a universal negative; I, a particular affirmative; and O, a particular negative. To aid the memory the following couplet is usually given, embodying the above symbols;

Asserit A, negat E, verum generaliter ambo:
Asserit I, negat O, sed particulariter ambo.

It must be particularly remembered that in every *universal* proposition, *the subject* is distributed, that is, is taken in the whole of its extension; but never in a *particular* proposition. But the distribution, or non-distribution of the *predicate*, does not depend on the *quantity*, but on the *quality* of the proposition. If any part of the predicate agrees with the subject, it must be *affirmed* of it, and cannot be denied of it. In an *affirmative* proposition, then, it is sufficient that *some part of the predicate* agrees with the subject; but in a *negative* proposition, it is necessary that the *whole* of

the predicate should *disagree* with the subject; thus, it is true that "to study Logic is useful," although the whole of the *predicate* "useful" does not agree with the subject; for many things are useful besides the study of Logic. On the other hand, "no vice is useful" would be false, if any part of the *predicate* "useful" agreed with the term vice; that is, if there were any one thing really useful which was a vice. The rules to be observed, then, respecting distribution are these:

1. All *universal*, but no *particular* propositions, distribute the *subject.*

2. All negative, but no *affirmative* propositions, distribute the *predicate.*

3. Whatever is universally affirmed or denied respecting any term distributed, may be equally affirmed or denied respecting every thing contained under that term: thus, if any thing is affirmed or denied *universally* respecting "animal," it may be equally affirmed or denied of *any* animal; of "man," "brute," "Alexander," "Bucephalus." This rule is generally expressed thus, "*Dictum de omni et de nullo.*"

CHAP. III.

OF THE AFFECTIONS OF PROPOSITIONS.

We now proceed to consider the *affections*, or relations of propositions, which is that property by which

they undergo various mutual changes. It must be remembered that a proposition is either universal or particular according to its *quantity*; and affirmative or negative according to its *quality*: and that these are denoted, A, *universal affirmative*; E, *universal negative*; I, *particular affirmative*; and O, *particular negative*. These four classes may be exemplified, thus;

A, Every vine is a tree.
E, No vine is a tree.
I, Some vine is a tree.
O, Some vine is not a tree.

Any given subject and predicate may thus form four distinct propositions; and these may undergo various changes by which one proposition may be deduced from another. A knowledge of these changes is of considerable importance in all kinds of argumentation. Of these the following are to be noticed; *Subalternation*, *Conversion*, and *Opposition*.

Section 1.

Of Subalternation.

Subalternation is the deducing *a particular* proposition from a *universal*, when they agree in *quality*; thus,

"All men are mortal;" therefore,
"Some men are mortal."

Or thus, " No tyrants are happy; therefore,
" Some tyrants are not happy."

In subalternation the *universal* proposition is called the *subalternans;* and the *particular*, which is deduced from it, is called the *subalterna.* In this case the propositions differ in *quantity* alone; and the maxims laid down in reference to propositions affected in this manner, are;

1. That the *truth* of the *particular* proposition follows from the *truth* of the *universal.*

2. The *falsity* of the *universal* from the *falsity* of the *particular.*

3. Whether *universal* or *particular*, they may be sometimes *both true,* and sometimes *both false.*

Section 2.

Of Conversion.

Conversion of propositions is the transposing of their terms, so that the subject is made the predicate, and the predicate the subject: thus,

" Samson was the strongest man;" therefore,
" The strongest man was Samson."

It is to be remembered that no conversion is used for any logical purpose unless it be *illative;* that is, except the truth of the one proposition is implied in the truth of the other; or as it is expressed, *the truth*

of the Converse is implied in the truth of the Exposita. Thus,

"No virtuous man is a rebel; therefore,
"No rebel is a virtuous man."

"Some boasters are cowards; therefore,
"Some cowards are boasters."

No conversion is allowed but that which is thus *ilative;* for in that case a term would be used *universally* in the one case, which was used only *partially* in the other. There are some propositions which distribute both terms; these, therefore, can easily be converted, while they continue to preserve both their quantity and their quality. This cannot, however, be done in all cases: conversion is therefore modified so as to be applicable to these cases; and the names given to these various kinds of conversion, are, *Simple Conversion; Conversion per accidens;* and *Contraposition.*

1. *Simple Conversion takes place when the quantity and quality of the propositions converted remain unchanged:* thus,

"No man is a quadruped;" therefore,
"No quadruped is a man."

"Some tree is a vine;" therefore,
"Some vine is a tree."

In these cases the subject and predicate merely change their places; and in this way *E*, and *I*, that is, all *universal negatives*, and *particular affirmatives*, may be converted with preservation of truth.

2. *Conversion per accidens.* This takes place when the *quality* of a proposition is preserved, and the *quantity* is changed. In some propositions the predicate is not distributed; in these cases, therefore, their simple conversion would not be illative, because there would be a term distributed in the *converse* which was not distributed in the *exposita*. Thus we cannot infer, because "all men are animals," that "all animals are men," because the term "animals," is distributed in the last instance, but not in the former. We must therefore limit its *quantity* from *universal* to *particular*, and then the conversion will be illative. Thus,

"All men are animals;" therefore,
"Some animals are men."

This is sometimes called conversion by *limitation;* but it is generally known as *Conversion per accidens;* and in this way A, and E, that is, *universal affirmatives*, and *universal negatives*, may be converted.

3. *Conversion by Contraposition.* This takes place when the term, that is, the *contradictory of the predicate*, is put for the *subject*, and the *quality* of the proposition is changed. In particular negatives, whether the quantity be changed or not, there will still be a term distributed in the converse which was not distributed before: the *quality* therefore must be changed by considering the negative as attached to the *predicate*, instead of being attached to the *copula*, and then the proposition may be regarded as a *particular affirmative:* for example,

"Some men are not wise."

This is a *particular negative*, the predicate of which is "wise;" take, then, the contradictory of this predicate, "not wise," and make it the subject of the proposition, and it will become a particular affirmative; thus,

"Some who are not wise are men."

This may be named conversion by *negation;* it is however generally called *Conversion by Contraposition.* In this way O, that is, *particular negatives* may be converted. But A, that is, *universal affirmatives*, may also be converted by this method; thus,

"Every animal is sentient;" therefore,
"What is insentient is not an animal."

In these three ways every proposition may be illatively converted; and to aid the memory, all these rules of conversion have been laid down in the following lines;

Simpliciter *feci*, convertitur *eva*, per accid;
Asto per contra, sic fit conversio tota.

The two vowels in *feci* represent E, and I, which are converted *simply;* the two vowels in *eva* denote E, and A, which are converted *per accidens;* and the two vowels in *asto*, stand for A, and O, which are converted by *contraposition.*

Section 3.

Of Opposition.

Another affection of propositions is called *Opposition.* This takes place when two propositions, having the same subject and predicate, differ in *quantity,* or *quality,* or *both.* With any given subject and predicate four distinct propositions may be made, any *two* of which may be said to be opposed; but there are only three kinds of opposition properly so called; *Contradictory, Contrary,* and *Subcontrary.*

1. *Contradictory Opposition takes place between two propositions when the one is universal, and the other particular; the one affirmative, and the other negative;* thus,

A, "Every man is an animal;"
O, "Some man is not an animal." Or,

E, "No vine is a tree;"
I, "Some vine is a tree."

In this kind of opposition we infer from the truth of the one, the falsity of the other: for they can never be both true, or both false, at the same time.

2. *Contrary Opposition takes place between two universal propositions, of which the one is affirmative, and the other negative;* thus,

A, "Every man is wise;"
E, "No man is wise."

In this kind of opposition the propositions may be both false at the same time, but they cannot both be true.

3. *Subcontrary Opposition takes place between two particular propositions, of which the one is affirmative, and the other negative;* thus,

I, "Some horses are swift;"

O, "Some horses are not swift."

In this kind of opposition both propositions may be true at the same time, but they cannot both be false.

If the *quantity* and *quality* of a proposition be known, it is evident that its truth or falsity must depend on its *matter*. The following rules have therefore been laid down respecting the *matter* of propositions, which must be carefully remembered.

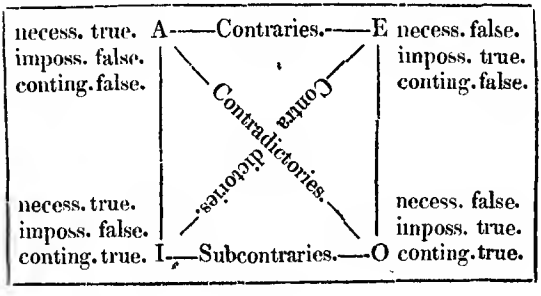
1. In *necessary matter all affirmatives are true, and negatives are false.* Thus, "*all* islands," or "*some* islands, are surrounded by water," must be true; because the *matter* is necessary: and to say, "*no* island is surrounded with water," or "some islands are *not* surrounded by water," would be false, for the same reason.

2. *In impossible matter all negatives are true, and affirmatives false.* Thus, "all circles," or "some circles are squares," is false, because the *matter* of these propositions is impossible; but, "all circles," "or some circles are *not* squares," is true, for the same reason.

3. *In contingent matter all universals are false,*

and particulars true. Thus, "*some* islands are fertile," or, "*some* horses are not swift," are both true, because they are particular propositions, and the matter is contingent; but, "*all* islands are fertile," or, "*all* horses are not swift," are both false, because they are universals, and the matter contingent. Hence in *contingent matter*, contradictories will always be *one true*, and the *other false*; contraries, *both false*, but never *both true*; and subcontraries, *both true*, but never *both false*.

All the maxims relative to Opposition have been arranged into the following scheme, in which the four propositions are expressed by their symbols; the different kinds of matter by the contractions, necess., imposs., conting.; and the truth or falsity of each proposition in each kind of matter expressed at length.



ELEMENTS OF LOGIC.

PART III.

OF REASONING.

THE third operation of the mind employed in argumentation is *Reasoning*, which is that process by which we infer one thing from another. It often happens that we cannot at once perceive the relation which subsists between our ideas; we therefore compare them with some common medium, and from their agreement or disagreement with this medium, we perceive whether or not they agree with each other. In this way we deduce one truth from another; and when this process is regularly carried on, it is called *discourse*, or *reasoning*.

It is to be particularly kept in mind, that in every instance in which we reason, whether it be to refute an adversary, or to convey instruction, or to satisfy our own minds on any particular subject, a certain process takes place in the mind, which is, when correctly carried on, in all cases, and on all subjects, one and the same. Every one may not be conscious of this process, nor be able to explain the principles on which it proceeds; but this is not to be wondered at. It

is the case with all our mental operations, and with every process that has been reduced to regular system. The practice must have preceded the theory—just as men must have been able to speak grammatically before Language was reduced to a system of Grammar. It is indeed customary to speak of *mathematical* reasoning, and *metaphysical* reasoning, and *political* reasoning, and *theological* reasoning, as if they were essentially different. But these are not *different kinds* of reasoning, founded on different principles. The process is the same in all these instances; and it is no more affected by the *nature* of the subject to which it is applied, than is an arithmetical process affected by the nature of the objects that are the subject of calculation.

If then the process of reasoning is in all cases the same, it must be an interesting employment to analyse this operation, and become acquainted with the principle on which it rests, and the laws by which it is regulated: and since an unsound and inconclusive mode of reasoning is often employed, it must be of great service to be acquainted with some general rules applicable to all cases, which may be employed either to convince, or to confute; and by which we may judge of the validity of any reasoning process. This is what Logic furnishes. Its principal object is to guard us against inconclusive reasoning. The third part of Logic, therefore, treats of *arguments*, which is reasoning expressed in words. When an argument is stated *at full length*, and in its

regular form, it is called a *syllogism;* the nature and properties of the Syllogism must therefore now be considered.

CHAP. I.

OF THE SYLLOGISM.

Every Argument consists of two parts; that which *is proved*, and that *by means of which* the proof is given. The former, before it is proved, is called the *question;* but after it is proved, it is called the *conclusion*. The means of proof, if stated *last*, is called the *reason;* but if stated *first*, it is called the *premises*. Every conclusion is deduced from two premises, either expressed or understood, which are granted to be true, and from which it must be admitted that the conclusion necessarily results or follows. A syllogism has therefore been defined, "an argument so expressed, that the conclusiveness of it is manifest, from the mere force of the expressions, without considering the meaning of the terms in which it is expressed." Thus, in the syllogism, "Y is X; Z is Y; therefore Z is X;" the conclusion is inevitable, whatever the terms X, Y, Z, may be considered respectively to indicate.

The order generally observed in stating a syllogism, is first to lay down the premises, and then to draw the conclusion; thus,

"All tyrants deserve death:
Cæsar was a tyrant; therefore,
Cæsar deserved death."

Every syllogism has only *three terms;* the middle term, and the two terms found in the conclusion. The *middle term* is the medium of comparison by which each of the terms is separately compared, in order to ascertain their agreement or disagreement with each other. The other two terms are called the *extremes,* and are always found in the *conclusion,* in the following order:

1. The *subject* of the conclusion is called the *minor term;* and,

2. The *predicate* of the conclusion is called the *major term,* because it has the greater extension.

Every syllogism has only *three propositions;*

1. The proposition in which the *major term* is compared with the middle term, is called the *major proposition.*

2. The proposition in which the *minor term* is compared with the middle term, is called the *minor proposition.*

3. The proposition in which the *minor term* is compared with the *major term,* is called the *conclusion,* because inferred from them.

These several parts of a syllogism will be best illustrated by a example; take therefore the following:

"Every reasonable being is accountable:
Man is a reasonable being; therefore,
Man is accountable."

This syllogism consists of three propositions; the first and the second are the *premises;* the third is the *conclusion.* "Man" is the *subject* of the conclusion, and is therefore the *minor term;* "accountable" is the *predicate* of the conclusion, and is therefore the *major term;* and "reasonable being" is the *middle term,* because it is with this that the other two terms are compared. In the *first* proposition the *major term* is compared with the *middle term;* it is therefore the *major proposition.* In the *second* proposition the *minor term* is compared with the *middle term;* it is therefore the *minor proposition.*

CHAP. II.

OF THE LAWS OF SYLLOGISMS.

The axiom on which the validity of the Syllogism depends, is called "dictum de omni et nullo;" that is, "whatever is predicated of a term distributed, whether affirmatively or negatively, may be predicated in like manner of every thing contained under that term." Thus, in the above examples, X is predicated of Y taken in the whole of it extension; and Z is contained under Y; therefore Z is predicated of X: so, "to deserve death," is predicated of "tyrants" distributed; "Cæsar" is contained in this number; therefore to "deserve death," is predicated of him. This axiom may be ultimately applied to all argu-

ments, and it is by their conformity to this rule that their validity must be ascertained. It cannot, however, be applied immediately even to all pure categorical syllogisms, except they be reduced to a particular form. To avoid the tediousness of doing this, two other axioms are commonly applied to practice, on which depends the validity of affirmative and negative conclusions. These are,

First, "*If two terms agree with one and the same third, they agree with each other.*" On this canon rests the validity of *affirmative* conclusions.

Second, "*If one term agrees, and another disagrees, with one and the same third, they disagree with each other.*" On this rests the validity of *negative* conclusions.

No categorical syllogism can be faulty which does not violate one of these canons; and none can be correct that does. Hence on these axioms are built all the general rules which are given below, and which are to be observed in order that we may ascertain whether syllogisms are valid arguments or not.

The general rules laid down for the construction of syllogisms are the following:

I. The *middle term must not be taken twice particularly, but must be distributed at least once in the premises.* If the middle term be not distributed it stands only for a part of its significates; hence it may happen that one of the extremes may be compared with one part of it, and the other compared with another. In this case there are therefore *two middle terms*, and

the extremes not being compared with the same, cannot be conclusively compared with each other. Thus.

"Some men are wise;
Some men are ignorant; therefore,
Some ignorant men are wise."

In this case the middle term "men" being taken *particularly* both in the major and minor proposition, it is not the same persons that are spoken of in these two propositions. There are therefore in fact *two* middle terms, or *four terms* in the syllogism; it is not therefore a valid argument. Again,

"White is a colour;
Black is a colour; therefore,
Black is white."

Here the middle term "colour" is not distributed, and the terms of the conclusion are compared, one with one part of it, and the other with another. And hence not being compared with the same, they cannot be conclusively compared with each other. Again,

"All vegetables grow;
An animal grows; therefore,
An animal is a vegetable."

It may be remarked also that the middle term must not be an *ambiguous term* used in different senses, for in this case there will be *two* middle terms *in sense*. though only *one in sound:* for example,

"*Light* is contrary to darkness:
Feathers are *light;* therefore,
Feathers are contrary to darkness."

In every case, then, the *middle term* must be distributed at least once in the premises, by being either the *subject* of a *universal*, or the *predicate* of a *negative* proposition: and if the middle term be distributed *once*, this is sufficient; because if one extreme has been compared to a *part* of the middle term, and another extreme compared to the *whole* of it, it is evident they must have been both compared to the same; and consequently they can be conclusively compared to each other.

2. *No term must be distributed in the conclusion which was not distributed in one of the premises.* Particular propositions are contained in universals, and therefore can be inferred from them; but universals are not contained in particulars; we cannot therefore infer a universal from a particular. But if a term is distributed in the conclusion, which was not distributed in one of the premises, this is to draw a universal from a particular; it is to employ the *whole* of a term in the conclusion, when you had employed only a *part* of it in the premises; and thus in reality to introduce a fourth term. When this rule is violated, it is called an *illicit process*, either of the *major* or of the *minor term*: thus,

"All men are animals:
A bird is not a man; therefore,
A bird is not an animal."

Here there is an *illicit process* of the *major term*. In the major proposition, "animal" is taken only in a

part of its extension, because it is the predicate of a *universal* proposition, the predicate of which is never distributed; whereas, in the conclusion, being the *subject* of a universal proposition, it is distributed.

"All tyrants are cruel:
All tyrants are men; therefore,
All men are cruel."

In this instance there is an *illicit process* of the *minor;* because "men," being the predicate of a universal proposition in the minor proposition, is *not* distributed; whereas in the conclusion, being the subject of a universal proposition, it is distributed.

3. *From two negative premises no conclusion can be drawn.* In this case the middle term is affirmed to disagree with both extremes; they cannot therefore be compared together; for when two ideas disagree with a third, we cannot infer either that they agree or disagree with each other: thus, if it be affirmed,

"A fish is not a quadruped;"
A bird is not a quadruped;"

nothing is proved, and therefore no conclusion can be drawn from it. But when the negative is a part of the middle term, it must be remembered that, though the proposition may appear to be negative, it is in reality an affirmative, and in that case a conclusion can be justly drawn; thus,

"What has no wings cannot fly:
A dog has no wings; therefore,
A dog cannot fly."

In this instance the middle term, "the-having-no-wings," is predicated of the minor proposition; it is therefore an affirmative, though it may seem to be a negative proposition, and hence the inference can be conclusively drawn.

4. *If one premise be negative, the conclusion will be negative.* In a negative premise the middle term is pronounced to disagree with one of the extremes; and the other premise, which must be affirmative, by the last rule, is pronounced to agree with the other extreme. They therefore disagree with one another; and as in this case they never can agree, the conclusion must be negative.

5. *From two particular premises nothing can be concluded.* If the two premises are affirmative, there will be no universal terms, and hence the middle term will be taken twice particularly, contrary to the first rule.

If the one be negative and the other affirmative, there will be an illicit process; thus,

Some animals are sagacious;
Some beasts are not sagacious; therefore,
Some beasts are not animals."

6. *If one of the premises be particular, the conclusion will be particular.* To infer a universal conclusion would be an *illicit process*: for if both premises are affirmative, there are three particular terms in the premises, and only one universal, the conclusion must therefore be particular.

If one premise be negative, there are two particular terms in the premises, the *predicate* of the *affirmative* preposition, and the *subject* of the *particular*; the predicate of the conclusion will therefore be a universal, and its subject particular, and hence the conclusion itself will be particular. The last two rules are sometimes embodied in this one: "the conclusion follows the weaker part;" because negatives and particulars are considered inferior to affirmatives and universals.

It is to be remarked, that although from two universal premises a universal conclusion may be generally inferred, yet this is not the case always; from such premises, however, a *particular* may always be drawn; for whatever is predicated of *all*, may always of course be predicated of *some*. Every syllogism that violates none of these rules, must be considered valid.

CHAP. III.

OF THE FIGURES OF SYLLOGISMS.

The figure of a syllogism consists in the place which the middle term occupies with respect to the Extremes of the Conclusion. There are only four Figures; and their excellence is to be judged of from the manner in which Aristotle's *dictum* can be applied to them.

The *first Figure*, which is by far the most clear and natural of all, is that in which the *Middle term is made the Subject of the major premises, and the Predicate of the minor:* thus,

"Every virtue is profitable:
Prudence is a virtue; therefore,
Prudence is profitable."

In the second Figure the Middle term is the Predicate of both premises: thus,

"Every virtue is praiseworthy:
Injustice is not praiseworthy; therefore,
Injustice is not a virtue."

In the *third Figure the Middle term is the Subject of both premises:* thus,

"All flowers are beautiful:
Some flowers are roses; therefore,
Some roses are beautiful."

The last, and the most awkward and unnatural of all the Figures, being the very reverse of the first, is that in which the *Middle term is the Predicate of the major premise, and the Subject of the minor:* thus,

"Every man is an animal:
Every animal is sentient; therefore,
Something that is sentient is a man."

"All vicious persons are unhappy:
Some unhappy persons are wise; therefore,
Some persons that are wise are vicious."

CHAP. IV.

OF THE MOODS OF SYLLOGISMS.

The mood of a syllogism is the legitimate determination of the three propositions according to their *quantity* and *quality*; for example,

"All wicked persons are miserable:
All tyrants are wicked; therefore,
All tyrants are miserable."

This syllogism is in the mood A, A, A, because each of the three propositions is a *universal affirmative*.

"All gold is precious:
All gold is a mineral; therefore,
Some mineral is precious."

This syllogism is in the mood A, A, I, because the major and the minor propositions are *universal affirmatives*, and the conclusion is a *particular affirmative*.

"He that is always in fear is not happy:
Misers are always in fear; therefore,
Misers are not happy."

This syllogism is in the mood E, A, E, because the major proposition, and the conclusion are *universal negatives*, and the minor a *universal affirmative*. Thus, when we designate the three propositions of a syllogism, in their order, according to their respective quantity and quality, we are said to determine the mood of that syllogism.

As there are four kinds of propositions, A, E, I, O, and three propositions in each syllogism, all the possible ways of combining these four propositions by threes will be sixty-four. Each of the four may be a major premise; each of these four majors may have four different minors; and these sixteen pairs of premises may have each four different conclusions. The statement will therefore stand thus; $4 \times 4 (= 16) \times 4 = 64$. This is a mere arithmetical calculation of all the moods possible, without any regard to logical rules; but many of these are inadmissible in practice, because they violate the rules formerly laid down for judging of a legitimate syllogism. The mood E, E, E, must be rejected, because it has *negative premises;* I, O, O, is also inadmissible, because it has *particular premises;* and so many others, for the same and other faults, must be rejected. Upon examination it has been ascertained that of the sixty-four possible moods there are only ten that can be used in a legitimate syllogism. Of these ten the following enumeration may be useful;

A, A, A; E, A, E; A, I, I; E, I, O; A, E, E, A, O, O; A, A, I; E, A, O; I, A, I; O, A, O.

All these moods are not allowable in each of the four Figures mentioned above; as they may violate some of the foregoing rules in one Figure, though not in another. For example, I, A, I, is an allowable mood in the third Figure; thus,

I, "Some afflictions are salutary:
A, All afflictions are unpleasant; therefore,
I, Some things that are unpleasant are salutary."

But this mood in the first Figure would be inadmissible; thus,

I, "Some herbs are fit for food:
A, Nightshade is an herb; therefore,
I, Some nightshade is fit for food."

In this instance we have an *undistributed middle*, and therefore the syllogism is not valid.

In the second Figure A, E, E, is valid, thus,

A, "Every virtue is praiseworthy:
E, Injustice is not praiseworthy; therefore,
E, Injustice is not a virtue."

But in the first Figure this mood would have an *illicit process of the major;* thus,

A, "Every man is an animal:
E, A horse is not a man; therefore,
E, A horse is not an animal."

In the first Figure the mood A, A, A, is a valid argument; thus,

A, "All human beings are entitled to liberty.
A, All slaves are human beings; therefore,
A, All slaves are entitled to liberty."

But in the third Figure this mood would have an *illicit process of the minor;* thus,

A, "All tyrants are cruel:
A, All tyrants are men; therefore,
A, All men are cruel."

By applying the moods to each Figure, it will be

found that each Figure will admit of only six moods which do not violate the rules against *undistributed middle*, and *illicit process*. Of these twenty-four valid moods some are useless, because they have only a *particular* conclusion when a *universal* might have been drawn. For example, A, A, I, in the first Figure is for this reason useless; thus,

A, "All human beings are entitled to liberty:
A, All slaves are human beings; therefore,
I, Some slaves are entitled to liberty."

Five of the twenty-four moods are for this reason considered unworthy of particular notice. Some of these moods, however, conclude in more figures than one; hence the number of legitimate conclusive moods is increased to *nineteen;* and to distinguish these Moods, and the Figures in which they are found, names have been devised, and embodied in the following verses, which ought to be committed to memory.

Fig. 1. Barbara, Celarent, Darii, Ferio: dato primæ.
Fig. 2. Cesare, Camestres, Festino, Baroco: secundæ.
Fig. 3. Tertiæ, Darapti, Felapton, vult Datisi,-que Cum Ferison, Disamis, Bocardo: sed dato quartæ
Fig. 4. Hæc Bamarip, Cameres, Dimaris, Fesapo, Fresison.

In these words the *three vowels* denote the propositions of which the syllogisms are composed, and indicate their *quantity*. The *consonants*, besides other uses, serve to keep in mind the figure of the syllo-

gism. The vowels which occur in the first syllable of each of these names shew the quantity and quality of the *major* proposition; the vowels of the second syllable shew the quantity and quality of the *minor*; and the vowels of the third syllable shew the quantity and quality of the *conclusion*. Thus, if it be said that any syllogism is *Celarent*, this shews that it is in the second mood of the First Figure; that its *major* proposition is E, a universal negative; its *minor*, A, a universal affirmative; and its *conclusion*, E, a universal negative. By studying these lines carefully, and trying several Syllogisms in different moods, various particulars respecting these Figures will be ascertained, and the reasons for them will be found in the preceding rules. The following may thus be deduced.

1. In the first Figure the major premise must be universal, and the minor affirmative. It is also the peculiar excellence of this Figure that A, E, I, O, that is, all kinds of conclusions can be proved by it: and A, that is all universal affirmatives, can be proved only by this Figure.

2. In the second Figure the major premise must be universal, and one of the premises must be a negative. Hence the second Figure can only prove *negative* conclusions; because the middle term being the predicate in both premises, it would not be distributed unless one premise were negative; and if one premise be negative the conclusion must be negative also.

3. In the third Figure the minor must be affirmative, and hence the conclusion must always be particular; because as the middle term is the subject of both premises, there would be an *illicit process of the minor* if a universal conclusion were drawn; since no affirmative proposition distributes the predicate.

4. In the fourth Figure the major term is predicated of the minor, and the minor is predicated of the middle, and the middle is predicated of the major, so that the major appears to be merely predicated of itself. It is therefore an inverted and awkward way of stating an argument, which is seldom or ever used.

One Mood in each Figure may be given as an example, and the student can exercise himself by forming examples of the rest.

First, *Barbara;* (Bar) "Every X is Y; (ba) every Z is X; therefore (ra) every Z is Y." Thus, let the major term, represented by X, be, "All wicked men," the minor term Z, be, "all tyrants;" and the middle term Y, be, "miserable;" you will then have the following syllogism in *Barbara* of the first Figure; thus,

Bar- "All wicked men are miserable;
ba- All tyrants are wicked men; therefore,
ra. All tyrants are miserable."

Second, *Cesare;* (Ce) "No X is Y; (sa) Every Z is Y; therefore (re) no Z is X." Let the major term X, be, "No tyrant;" and the minor term Z, be, "Every benevolent person;" and the middle term Y, be, "happy;" you will then have the following syllogism in *Cesare* of the second Figure; thus,

Ce- "No tyrant is happy;
sa- Every benevolent man is happy; therefore,
re. No benevolent man is a tyrant."

Third, *Darapti;* (Da) "Every Y is X; (rap) every Y is Z; therefore (ti) some Z is X." Let the major term X, be, "painful;" the minor term, Z, "profitable;" and the middle term Y, "All afflictions;" you will then have the following syllogism in *Darapti* of the third Figure; thus,

Da- "All afflictions are painful;
rap- All afflictions are profitable; therefore,
ti. Some things that are profitable are painful."

Fourth, *Bamarip;* (Ba) "Every X is Y; (mar) every Z is Y; therefore (ip) some Z is X." Let the major term X, be "All tyrants;" the minor term Z, "unhappy;" and the middle term Y, "proud;" you will then have the following syllogism in *Bamarip* of the fourth Figure; thus,

Ba- "All tyrants are proud;
mar- All proud persons are unhappy; therefore,
ip. Some persons that are unhappy are tyrants."

CHAP. V.

OF THE REDUCTION OF SYLLOGISMS.

The four Moods in the first Figure, as they are the clearest and most natural, are called *perfect.* The

Moods of the other Figures are called *imperfect*, because Aristotle's *dictum* cannot be immediately applied to them. But as it is on this dictum that all Reasoning ultimately depends, all the Moods of the other three Figures can be brought, in some way or other, into one of the four Moods of the first Figure. When a syllogism is thus operated upon it is said to be *reduced* from an imperfect to a perfect figure. This has given rise to the Reduction of syllogisms; and any argument that cannot be so reduced as to be stated legitimately according to the first Figure is not valid.

In the reduction of Syllogisms we are not allowed of course to change the terms, or introduce any new proposition. The premises being laid down, and their truth granted, all that is permitted is that we so convert, or transpose, or otherwise operate on these premises, that they may become subject to the laws of the first Figure. This may be done in two ways, either by *Ostensive Reduction*, or by *Reductio ad impossible*.

Section 1.

Of Ostensive Reduction.

By Ostensive Reduction we prove in the first Figure, from the premises of the imperfect syllogism originally given, either the very same conclusion, or one that implies it, and from which it may be justly and easily deduced. The truth of any proposition

implies the truth of its illative converse. We are therefore allowed to convert the major or the minor premise, by the methods of *Conversion* formerly explained; and, if necessary, to transpose the premises after they have thus been converted: in this way the imperfect Mood may be reduced to one of the four Moods of the first Figure. Take the following as examples:

"Every virtue is praiseworthy:
Injustice is not praiseworthy; therefore,
Injustice is not a virtue."

This is a syllogism in *Camestres* of the second Figure, and it may be reduced to *Celarent* of the first, by simply converting the minor, and then transposing the premises; thus,

"That which is praiseworthy is not injustice:
Every virtue is praiseworthy; therefore,
No injustice is a virtue."

Again:

"All tyrants are cruel:
All tyrants are men; therefore,
Some men are cruel."

This is a syllogism in *Darapti* of the third Figure; but it may be reduced to *Darii* of the first, by converting the minor premise *per accidens;* thus,

"All tyrants are cruel:
Some tyrants are men; therefore,
Some men are cruel."

Again:

"Some slaves are not discontented:
All slaves are wronged; therefore,
Some who are wronged are not discontented."

This is a syllogism in *Disamis* of the third Figure, and it may be reduced to *Darii* of the first, by converting the major by *contraposition*, and then transposing the premises; thus,

"All slaves are wronged:
Some who are not discontented are slaves; therefore,
Some who are not discontented are wronged."

In this case the conclusion is the converse by *negation* of the orlginal conclusion, and therefore may be inferred from it. By these different methods all the imperfect moods may be reduced to the four perfect moods of the first Figure; and this is called *Ostensive Reduction*, because either the very same conclusion is proved, or one which implies it, and from which it may be justly inferred.

Section 2.

Of Reductio ad impossible.

By *Reductio ad impossible* we prove in the first Figure, not directly that the conclusion of the imperfect syllogism is *true*, but that it cannot be false; or in other words, that an absurdity would follow on

the supposition of its being false. The following will furnish an example:

"All truly wise men live virtuously:
Some philosophers do not live virtuously; therefore,
Some philosophers are not truly wise men."

If this conclusion be not true its *contradictory* must be true; viz.

"All philosophers are truly wise men."

Make this proposition, then, the minor premise of the above syllogism, and a false conclusion will be proved; thus,

"All truly wise men live virtuously:
All philosophers are truly wise men; therefore,
All philosophers live virtuously."

This conclusion is the *contradictory* of the original minor premise; it must therefore be false, because the *premises* are always supposed to be granted. If this conclusion is false, then one of the premises from which it has been correctly deduced, must be false also; but the *major premise*, being one of those originally granted, must be true; the falsity must therefore be in the *minor premise*. But the minor premise is the contradictory of the original conclusion; hence the original conclusion must be true.

This kind of reduction is a very indirect and obscure mode of reasoning, and is seldom employed except for *Baroco* and *Bocardo*. These two moods, however, can be reduced *ostensively* by *contraposition*.

The verses formerly quoted are of great service in

the reduction of syllogisms. The names given to the various Moods in the several Figures, although they may seem harsh and unmeaning, have been framed so as to point out the manner in which each of the imperfect Moods is to be reduced. The initial letters of all the Moods are B, C, D, F. The first letter in every imperfect Mood indicates that it is to be reduced to that Mood of the First Figure which begins with the same letter. If its initial letter be B, it must be reduced to *Barbara;* if it be C, to *Celarent;* if D, to *Darii;* and if F, to *Ferio.* This rule has been expressed by the old Logicians, thus;

Barbara demonstrat, B; Celarent, C, reducit;
D, redit ad Darii; F, redit at Ferio.

Besides the initial letters there are other consonants found in the middle or end of the names which designate the different Moods, which are also made use of to indicate the *kind* of reduction that is to be employed. These letters are *s*, *p*, *m*, and *c*, and their meaning is as follows: *s*, shews that the proposition denoted by the vowel immediately preceding it, is to be *converted simply; p*, that the proposition denoted by the vowel immediately preceding it, is to be *converted per accidens;* and *m*, shews that the premises are to be *transposed.* Thus in *Bamarip*, the B shews that it must be reduced to *Barbara;* the *m* that the premises must be transposed; and the *p*, that the conclusion must be converted per accidens. So in *Camestres*, the C indicates that it must be re-

duced to *Celarent;* the *m,* shews that the premises must be transposed; and the two *ss* shew that the minor premise and the conclusion must be converted simply. The other consonant *c* points out the *reductio ad impossible.* Wherever it occurs it shews that the proposition denoted by the vowel immediately before it, must be left out, and the contradictory of the conclusion substituted in its place; consequently in *Baroco* the contradictory of the *conclusion* is to be substituted for the *minor premise;* and in *Bocardo* it is to be substituted for the *major.* These rules have been expressed thus;

S, vult simpliciter verti; P, vero per accid.
M, vult transponi; C, per impossibile duci.

CHAP. VI.

OF HYPOTHETICAL SYLLOGISMS.

We have hitherto been considering *pure* categorical syllogisms. It is often necessary, however, to introduce into Reasoning various kinds of *conditional* propositions; and as the force of the argument sometimes turns on these hypothetical premises, it is necessary that we notice this class of syllogisms, and explain the rules whereby their validity may be ascertained.

Sometimes a hypothetical conclusion is inferred from a hypothetical premise, while the reasoning pro-

cess remains, properly speaking, purely categorical. In this case the force of the reasoning does not turn on the hypothesis; the *condition* expressed is considered as attached *to one of the terms;* and the reasoning proceeds, and is to be judged of, in the same way as if it were a categorical syllogism. For example;

"Every conqueror is *either a hero or a villian:*
Cæsar, was a conqueror; therefore,

Cæsar was *either a hero or a villian.*"

In this case if "*either a hero or a villian,*" be considered as merely the predicate of the major premise, and the predicate of the conclusion, the syllogism may be considered merely *categorical.*

But when the reasoning *rests* on the hypothesis, and a categorical conclusion is drawn from a hypothetical premise, then the syllogism is to be considered *hypothetical;* and rules have been devised for ascertaining the validity of such arguments, without bringing them into the categorical form. Of hypothetical Syllogisms there are two kinds, the *Conditional,* and the *Disjunctive.*

Section 1.

Of Conditional Syllogisms.

When in any syllogism the *major premise* is a conditional proposition, the syllogism is called *Conditional;* thus,

"If there is a God, he ought to be worshipped:
But there is a God; therefore,
He ought to be worshipped."

In this example the major premise is *conditional;* the syllogism is therefore called by that name. If only the *major* proposition be conditional, as in the above example, the conclusion will be categorical: but if the *minor* be conditional, the conclusion will also be conditional; thus,

"All tyrants deserve death;
If Cæsar oppresses the people, he is a tyrant; therefore,
If Cæsar oppresses the people, he deserves death."

This kind of argument, however, should be avoided as much as possible, as it is an awkward mode of reasoning; but syllogisms whose *major* only is hypothetical may be used with great propriety and advantage.

In explaining this kind of syllogism, it is to be observed, that all *conditional propositions* are made up of two distinct parts, and only two, which are in fact two *categorical propositions.* Of these the one results from the other, and expresses the condition on which the predicate agrees or disagrees with the subject; the other joins or disjoins the predicate and the subject. The proposition from which the other results, or which expresses the condition, is called the *antecedent;* that which results from it is called the *consequent;* and the connection between the two, expressed by the word "*if,*" is called the *consequence.* The

natural order for such a proposition is, that the antecedent should come *before* the consequent; but this is not material, as we often find it reversed; thus,

"The poor are happy, if they are contented."

In all propositions of this kind, if they are correct in point of form, the relation between the antecedent and consequent must ever be true and real; that is, the truth of the antecedent must necessarily imply the truth of the consequent; for otherwise the proposition will be false, and ought not to be admitted into argumentation. The antecedent and the consequent may be both false, or they may be both true, in themselves considered; but it must in every case be *true* that the consequent *follows* from the antecedent: hence the truth or falsity of a conditional proposition depends entirely on the consequence. This will appear from the following examples:

"If Christianity is of divine origin, it ought to be embraced:"

In this case both the antecedent and the consequent are *true* in themselves; and the whole proposition is *true* likewise, because there is a real connexion between the antecedent and the consequent.

"If Christianity is an imposture, it ought to be abandoned:"

In this instance both antecedent and consequent are *false*, considered separately and in themselves; but the *whole* proposition is *true*, because the consequent

follows from the antecedent; that is, they are so connected that if you admit the one, you must admit the other also.

It is particularly to be remembered, however, that the truth or falsity of a conditional proposition does not at all depend on the truth or falsity of the two categorical propositions of which it is composed. In the last instance the antecedent and the consequent were both *false;* yet the whole proposition was *true*. But the reverse of this may take place; that is, the antecedent and the consequent may be both *true* in themselves, and yet the *whole* proposition be *false;* thus,

"If Christianity is from God, it is but partially known:"

Here it is *true* that "Christianity is from God," and it is *true* also that "it is but partially known;" yet it is *not true* that the latter of these propositions results from the former, or depends upon it. The *whole* proposition, therefore, is *false*, because there is no necessary connexion between the antecedent and the consequent. No conditional proposition, then, must be admitted into argumentation which does not contain some certain and genuine condition; that is, in which the antecedent necessarily implies the consequent.

It follows, then, that when any conditional proposion is assumed in reasoning, if we admit the antecedent, we must at the same time necessarily admit the consequent; and if we reject the consequent, we are bound in like manner to reject the antecedent: for

as the antecedent always expresses some condition which necessarily implies the truth of the consequent, by admitting the antecedent we admit this condition, and therefore are bound to admit the consequent likewise. In like manner, if it appears that the consequent ought to be rejected, the antecedent ought evidently to be rejected also, because, as we have just shewn, the admitting of the antecedent would necessarily imply the admission of the consequent. There are therefore two rules, applying to conditional propositions, which must be kept particularly in mind, because conditional syllogisms are founded on them. These are,

First; *If the antecedent is granted, the consequent may be inferred:* and,

Secondly, *If the consequent be denied, the antecedent may be denied.*

In accordance with these rules there are two methods of arguing in conditional syllogisms, which lead to a certain and unavoidable conclusion. The first, founded on the first rule, takes place when *the minor premise admits the antecedent;* then we are said to argue from the admission of the antecedent, to the admission of the consequent. This is called a *Constructive* conditional syllogism, because the whole of the conditional proposition is thus established. Thus,

"If there is a God, he ought to be worshipped:
But there is a God; therefore,
He ought to be worshipped."

In this case *the antecedent is admitted in the minor*

premise; it is evident, therefore, from the first rule, that the conclusion must admit the consequent; and thus the *whole* conditional proposition, both antecedent and consequent, is established. If A is B, C is D: but A is B; therefore C is D."

The other method of arguing legitimately in conditional syllogisms is founded on the second rule, and it takes place when the *minor premise rejects the consequent;* and we are then said to argue from the removal of the consequent, to the removal of the antecedent. This is called a *Destructive* conditional syllogism, because the whole of the conditional proposition is thus rejected or destroyed. Thus,

"If the season has been good, rice must be cheap:
But rice is not cheap; therefore,
The season has not been good."

In this case *the consequent is contradicted in the minor premise,* and the antecedent is contradicted in the conclusion; thus the *whole* of the conditional proposition is removed. If A is B, C is D: but C is not D; therefore A is not B.

These two methods of arguing include all the classes of conditional syllogisms from which a legitimate conclusion can be drawn. It is to be observed, however, that in syllogisms of this kind, the rules given above respecting *conditional propositions* must be strictly observed, otherwise nothing can be legitimately proved. If, for instance, in the last case, the minor premise were to deny the *antecedent,* instead of

denying the *consequent*, which is called arguing from the removal of the antecedent to the removal of the consequent, no legitimate inference could be drawn: because, although the antecedent always expresses some real condition which when once admitted necessarily implies the consequent, yet it does not follow that there is no other condition from which the same consequent may follow; hence, after removing the antecedent, the consequent many still follow from *some other antecedent*. Thus, were we to say, "if a stone is exposed to the rays of the sun, it will contract a certain degree of heat," we affirm a *true* proposition; and admitting the antecedent, we must also admit the consequent. But as there are other ways in which a stone may contract heat, it will not follow from the *denial* of this antecedent, that therefore the consequent cannot take place. If, therefore, we deny the antecedent, and argue from it, the reasoning will be false. Thus,

"If a stone is exposed to the rays of the sun, it will contract a certain degree of heat:
But it has not been exposed to the rays of the sun; therefore,
It has not contracted a certain degree of heat."

This reasoning is evidently false, because there are many other ways in which a stone may contract heat besides from exposure to the rays of the sun. This mode of reasoning is therefore inadmissible in conditional syllogisms.

Again, if the minor premise admits the *consequent* instead of admitting the *antecedent*, in this case also the conclusion will not be legitimate, because the same consequent may follow from some other antecedent. The admitting of any consequent does not prove in what way this result has happened, but only that some one of the antecedents that could lead to this result must have existed. Take the proposition above as an example; "if a stone is exposed to the rays of the sun, it will contract a certain degree of heat;" admitting the consequent, *that it has contracted a certain degree of heat*, we are not bound to admit the antecedent, *that it has therefore been exposed to the rays of the sun*; because there are many other ways in which this heat may have been contracted. This is called arguing from the admission of the consequent to the admission of the antecedent, and is evidently inadmissible.

The following rules must therefore be observed in conditional syllogisms.

1. *If the minor affirms the antecedent, or denies the consequent, the conclusion will be valid.*

2. *If the minor affirms the consequent, or denies the antecedent, nothing can be inferred.*

Section 2.

Of Disjunctive Syllogisms.

As when the major proposition is conditional the

syllogism is called conditional; so when the major proposition is disjunctive, the syllogism to which it belongs is called a *disjunctive syllogism*. For example, A is either B, or C, or D: but A is neither B nor C, therefore A is B. Thus,

"The world is either self-existent, or the work of some finite, or of some infinite Being:
But it is neither self-existent, nor the work of a finite being, therefore,
It is the work of an infinite Being."

A disjunctive proposition may consist of any number of categorical propositions; and of these some *one* at least must be true, or the whole proposition will be false. Each of these categorical propositions give a particular predicate to the subject of the whole disjunctive proposition, and of these several predicates *one* is affirmed necessarily to belong to the subject, to the exclusion of all the rest. This particular predicate, however, is left undetermined in the *major proposition*; in the *minor* we determine which it is; and then in the *conclusion* we prove that *that* predicate belongs to the subject. As soon as we determine the particular predicate that necessarily belongs to the subject, all the rest are to be rejected, and then the remaining one is affirmed to be true. When, therefore, in a disjunctive syllogism the several predicates are enumerated in the *major*, if the *minor* establishes any one, or any number of these predicates, the *conclusion* ought to remove all the rest; or if in the *mi-*

nor all the predicates but *one* are removed, the *conclusion* must necessarily establish that one. Thus, in the disjunctive syllogism given above, the *major* affirms one of these predicates to belong to the earth—either *self-existence*, or that it is *the work of some finite being*, or that it is the work of an *infinite Being*. Two of these predicates are removed in the *minor* proposition, viz. *self-existence*, and its being *the work of some finite being;* hence in the *conclusion* the other predicate is necessarily ascribed to it; that is, it is affirmed to be *the work of an infinite Being*. A is either B, or C, or D: but A is not B or C; therefore it is D.

"It is either spring, summer, or winter:
But it is not spring or summer; therefore,
It is winter."

In the above example all the categorical propositions except *one* are denied; and hence the conclusion is a categorical proposition. But sometimes after one or more of the categorical propositions are denied, there are more than one predicate remaining; in this case the conclusion will be a disjunctive proposition. For example; A is either B, C, D, or E: but A is not B or C; therefore it is D or E. Thus,

"It is either spring, summer, autumn, or winter:
But it is neither spring nor summer; therefore,
It is either autumn or winter."

In these examples it is implied that only one of the categorical propositions can be true; hence if the

minor *affirms* that proposition, the rest must be *denied* in the conclusion. For example, in the above syllogism we may say, A is either B, C, D, or E: but A is B, therefore it is neither C, D, nor E. Thus,

"It is either spring, summer, autumn, or winter.
But it is spring; therefore,
It is neither summer, autumn, nor winter."

CHAP. VII.

REDUCTION OF HYPOTHETICAL SYLLOGISMS.

The rules laid down above are quite sufficient for trying the validity of all hypothetical arguments; as, however, all reasoning may ultimately be brought to the test of Aristotle's *dictum*, we must now show how a hypothetical syllogism can be reduced so that this test may be at once applied to it. This is called the *reduction of hypotheticals*.

If only the major premise be hypothetical, and the antecedent and consequent happen to have the same subject, the reduction of a hypothetical syllogism is easily effected. In this case the *minor premise* and the *conclusion* are categorical; they can therefore easily be formed into a regular categorical syllogism, by supplying a categorical *major*. Take for example the following hypothetical syllogism:

"If Cæsar was a tyrant, he deserved death:
But Cæsar was a tyrant; therefore,
He deserved death."

In this example the major premise is conditional, the antecedent and consequent have the same subject, and the minor premise and conclusion are categorical, because they merely express the fact that Cæsar was a tyrant, and that he on that account deserved death. To reduce the whole syllogism to a categorical form a categorical major premise is wanted. Assume, then, as a *major* the proposition that "*all tyrants deserve death*," and the syllogism is reduced to *Barbara*; and the same conclusion is drawn as when the syllogism was in the hypothetical form. Thus,

Bar- "All tyrants deserve death:
ba- But Cæsar was a tyrant; therefore,
ra. He deserved death."

But it often happens in a hypothetical syllogism, that the antecedent and consequent of the conditional proposition have not the same subject. In this case the above method of reduction will not apply, because a categorical premise cannot be formed which will be equivalent to the original conditional proposition. Another method has therefore been adopted, which is, to consider every conditional proposition as a universal affirmative categorical proposition, of which the Terms are entire propositions, the *antecedent* answering to the *subject*, and the *consequent* to the *predicate*.

Take for example the following conditional syllogism:

"If the season is good, the rice is likely to be cheap:
But the season is good; therefore,
The rice is likely to be cheap."

In this instance to say, "If the season is good, the rice is likely to be cheap," is equivalent to saying, "the case of the season being good, is a case of the rice being likely to be cheap:" and the minor premise of this conditional syllogism, is equivalent to saying, "the present case is the case of the season being good." By adopting these as the premises a conclusion may be drawn in *Barbara*, exactly equivalent to the original conclusion of the conditional syllogism. Thus,

Bar- "The case of the season being good, is a case of the rice being likely to be cheap:
ba- The present case is the case of the season being good; therefore,
ra. The present case is the case of the rice being likely to be cheap."

The above is an example of a *Constructive* conditional syllogism reduced to *Barbara*. In like manner a *Destructive* conditional syllogism, may be reduced to *Celarent*; thus,

"If the Stoics are right, pain is no evil:
But pain is an evil; therefore,
The Stoics are not right."

This syllogism is equivalent to the following:

"The case of the Stoics being right, is the case of pain being no evil:
The present case is not the case of pain being no evil; therefore,
The present case is not the case of the Stoics being right."

In this form the syllogism is in *Camestres*, which can easily be reduced to *Celarent*, by the method of reduction formerly explained.

All hypothetical syllogisms may be reduced in the manner above stated. The mode of expression, however, in those cases where the antecedent and consequent have not the same subject, is exceedingly awkward and circuitous. A more convenient form may sometimes be substituted, by taking "*true*" for one of the terms; thus,

"That pain is no evil is not true:
That pain is no evil is asserted by the Stoics, therefore,
Something asserted by the Stoics is not true."

In some cases also it may be better to unfold the argument into two syllogisms. Take for example the following syllogism:

"If Cæsar is a good king, Rome is likely to prosper:
But Cæsar is a good king; therefore,
Rome is likely to prosper."

This conditional syllogism may be reduced to *two* categorical syllogisms; thus,

"Cæsar is a good king:
The governor of Rome is Cæsar; therefore,
The governor of Rome is a good king."

Again:

"Every country governed by a good king is likely to prosper:
Rome is governed by a good king; therefore,
Rome is likely to prosper."

These categorical syllogisms are in *Barbara*, and from them the very same conclusion is drawn that we have in the above conditional syllogism.

It is to be observed, however, that, in ordinary practice, it is not necessary to reduce Hypotheticals to Categoricals, in any of the ways mentioned above, in order to ascertain their validity. Their own rules are sufficient for this purpose, without our subjecting the argument *directly* to the test of Aristotle's *dictum*. The above rules shew, however, that they *can* be reduced if required; and that they, as well as Categorical syllogisms, depend on that one simple principle on which all Reasoning rests.

CHAP. VIII.

OF IRREGULAR SYLLOGISMS.

Thus far we have been considering syllogisms, which, not being defective, or expressed in an abridged

form, are denominated *regular*. In these arguments the parts are complete; that is, the three propositions of which the syllogisms consist are represented in due form. But there are various forms of Argument which are imperfect, as generally used, but which can easily be expanded into regular syllogisms. These have been called *irregular syllogisms;* the following are the most important.

1. *The Enthymeme.* This is a Syllogism which seems to consist of only two propositions, but the other is only suppressed. Thus,

> "Cæsar was a tyrant; therefore,
> Cæsar deserved death."

In this instance there are only true propositions expressed, and the syllogism appears to be imperfect, but it may be easily formed into a regular syllogism by merely supplying the premise that is wanting. If in the above instance the *major premise* is supplied, the syllogism will be seen to be perfect, thus,

> "Every tyrant deserves death:
> Cæsar was a tyrant; therefore,
> Cæsar deserved death."

Again:

> "Every man is mortal; therefore,
> Every king is mortal."

In this case the *minor premise* is omitted; let it be supplied, and the syllogism is regular, thus,

"Every man is mortal:
Every king is a man; therefore,
Every king is mortal."

This form of reasoning is called *Enthymeme*, because one of the premises is retained in the mind. This is however in reality a prefect syllogism, although it seems mutilated in form. It is the ordinary mode of speaking and writing, not only on rhetorical subjects, but, generally speaking, even when engaged in close argumentation. It never was intended, that, on all occasions, reasoning should be carried on in a series of syllogisms regularly expressed. It often happens that some one of the premises on which our reasoning turns, is either a self-evident truth, or one that is familiar to us, or that is acknowledged by our opponent. In this case, unless for some particular purpose, it would be mere waste of time to state the syllogism at length, and draw the conclusion in due form. The Enthymeme, or this abbreviated method of reasoning, is therefore adopted, which shortens discourse, gives a lively vigour to our arguments, and by leaving something to be inferred by the mind itself, both pleases, and excites attention.

However long the reasoning process may be that is carried on in this manner, and however concisely the train of argument may be expressed, it may easily be reduced to a series of regular syllogisms; and where the conclusiveness of the argument is not evident from the mere meaning of the terms, it is only by this method that the validity of the arguments can be as-

certained. There is no difficulty, however, in filling up the Enthymeme, by supplying either the major or the minor premise, so as to make it a perfect syllogism. All the *terms* which are necessary to form the *major* or the *minor* premise that may be wanting to complete the syllogism, will be found in the *premise* and the *conclusion* of which the Enthymeme consists. And the following rules will direct us in what cases we should supply the one, and in what cases the other.

First: If the term *twice repeated* be found in the *subject* of the conclusion, the *major premise* must be supplied. Thus, in the first example given above, the term *twice repeated* is "Cæsar;" and this term is the *subject* of the conclusion; hence the *major premise* is in that case supplied; thus,

"Every tyrant deserves death:
Cæsar was a tyrant; therefore,
Cæsar deserved death."

Again:

"Man is a reasonable being; therefore,
Man is accountable."

Here the term *twice repeated* is "Man," and it is the *subject* of the conclusion; hence the *major premise* must be supplied; thus,

"Every reasonable being is accountable:
Man is a reasonable being; therefore,
Man is accountable."

Second: If the term *twice repeated* be found in the *predicate* of the conclusion, the *minor premise* must

be supplied. Thus, in the second example given above, the term *twice repeated* is "mortal," and this term is the *predicate* of the conclusion; the *minor premise* must therefore be supplied; thus,

"Every man is mortal:
Every king is a man; therefore,
Every king is mortal."

Again:

"A free people must be happy; therefore,
The English must be happy."

Here the term *twice repeated* is "happy," which is the *predicate* of the conclusion; in this case, then, the *minor premise* must be supplied; thus,

"A free people must be happy:
The English are a free people; therefore,
The English must be happy."

In all these cases the reasoning is purely syllogistic, and must be judged of by the rules formerly laid down.

2. *The Sorites.* This is a mode of reasoning which consists of several propositions so arranged, that the predicate of the first becomes the subject of the second, and so on, in a regular progression, till at length, in the ultimate conclusion, the last predicate is affirmed of the first subject. In this way we have a string of syllogisms, in the first figure, in which the conclusion of each is made the premise of the next, till we arrive at the last conclusion. A is B, B is C, C is D, D is E, E is F, F is G, therefore A is G. Thus,

"The soul is a thinking substance;
A thinking substance is spirit;
Spirit has no extension;
What has no extension has no parts;
What has no parts is indissoluble;
What is indissoluble is immortal; therefore,
The soul is immortal."

This combination of propositions may be continued to any length without weakening the ground on which the conclusion rests, because the Sorites has as many *middle terms* as there are intermediate propositions between the first and the last; and consequently may be drawn out into as many separate syllogisms as there are middle terms. It is therefore nothing but a series of syllogisms, of the first figure, expressed in this abridged manner, in order that we may proceed with greater rapidity in our reasoning process. If we wish to ascertain the validity of this argument, we can easily do so, by resolving the series into the distinct syllogisms of which it is composed.

If the above example be drawn out into the separate syllogisms of which it consists, it will be found that the first syllogism in the series has for its *major premise* the *second* proposition of the Sorites, and for its *minor premise* it has the *first* proposition; thus,

"A thinking substance is spirit:
The soul is a thinking substance; therefore,
The soul is spirit."

The conclusion of this first syllogism must now be-

come the *minor premise* of the second syllogism, thus,

"Spirit has no extension:
The soul is spirit; therefore,
The soul has no extension."

This conclusion must now be made the *minor premise* of the next syllogism; and so on, to the end of the series. The *first* proposition in a Sorites is therefore the only *minor premise* that is expressed; because each successive conclusion becomes the minor premise of the succeeding syllogism. Hence in a Sorites only the *first* proposition and the *conclusion* can be *particular;* because in the first figure the *minor proposition* may be particular, but not the *major;* and all the propositions after the first, till the conclusion of the Sorites, are major premises. It is evident also that in a Sorites there may be *one*, and only one, negative premise, namely the last in the series; for if any of the others were negative, the result would be that one of the syllogisms of the Sorites would have a *negative minor premise*, which in the first figure is incompatible with correctness, since in that figure the minor must always be affirmative.

It is evident too that a Sorites may be formed of Hypothetical in the same way as it is with Categorical propositions. Any number of conditional propositions may be so joined together in a series, that the consequent of the one shall become successively the antecedent of the next, in which case by establishing

the antecedent of the first proposition, we establish the antecedent of the last; or by removing the last consequent, we remove also the first antecedent. The following is an example of a *Constructive* conditional Sorites; if A is B, C is D; if C is D, E is F; if E is F, G is H; but A is B, therefore G is H. Thus,

"If the Scriptures are the word of God, it is important that they should be well explained:
If it be important that they should be well explained, they deserve to be diligently studied:
If they deserve to be diligently studied, an order of men should be set apart for that purpose;
But the Scriptures are the word of God, therefore an order of men should be set apart for diligently studying them."

In the same way a *Destructive* conditional Sorites may be formed; but in this case we must go back from the denial of the last consequent to the denial of the first antecedent. For example, if A is B, C is D; if C is D, E is F; if E is F, G is H; but G is not H, therefore A is not B. Thus,

"If the soul is material, it must have extension;
If it has extension, it must have parts;
If it has parts, it must be dissoluble;
But the soul is not dissoluble; therefore,
It is not material."

The validity of this kind of argument may be ascertained by resolving it into its distinct syllogisms, and trying them by the rules formerly laid down.

3. *The Dilemma.* This is a complex conditional

syllogism, which is generally employed to prove the absurdity or falsity of some assertion. In order to this we assume a conditional proposition, the *antecedent* of which is the assertion to be disproved, and the *consequent* is a disjunctive proposition, enumerating all the possible suppositions on which that assertion can take place. If then it appears that all these several suppositions ought to be rejected, it is plain that the antecedent, or the assertion itself, must be rejected likewise. When therefore a proposition of this kind is made the *major* of a syllogism, if the *minor* rejects all the suppositions contained in the consequent, it follows necessarily that the *conclusion* ought to reject the antecedent, which is the matter to be disproved.

The Dilemma, like Simple Conditional Syllogisms, sometimes, takes the *Constructive* form. When we have a *major premise* having several *antecedents*, all with the same *consequent*, and these antecedents are disjunctively granted in the minor premise; that is, it being granted that some one of them is true, then the consequent common to all these antecedents may be inferred, as in the case of a Simple Constructive Syllogism. For example, if A is B, C is D; and if X is Y, C is D; but either A is B, or X is Y; therefore, C is D. Thus,

"If the guilty are detected, their punishment makes them miserable;
If they are not detected, their own consciences make them miserable:
But they must either be detected or not;
Therefore, the guilty are miserable."

If the several antecedents have each a *different consequent*, then, if they are disjunctively granted, the consequents can only be disjunctively inferred. For example; if A is B, C is D; and if X is Y, E is F: but either A is B, or X is Y; therefore either C is D, or E is F; thus,

"If Æschines joined in the public rejoicings, he is inconsistent;
If he did not, he is unpatriotic:
But he either joined, or did not join, in the public rejoicings; therefore,
He is either inconsistent or unpatriotic."

In these two cases the syllogisms are evidently constructive.

The Dilemma, sometimes takes the *Destructive* form. When there is only one antecedent with several consequents, if in the minor premise you deny the *whole* of these consequents, you may in the conclusion deny the *whole* of the antecedents. For example; If A is B, C is D, and E is F; but C is not D, and E is not F; therefore A is not B. Thus,

"If the world existed from eternity, there would be writings prior to the Mosaic:
If it existed from eternity, the useful arts would be of unknown antiquity:
But there are no records prior to the Mosaic, and the useful arts are not of unknown antiquity; therefore,
The world is not eternal."

Again: If A is B, C is D; and if X is Y, E is F: but C is not D, and E is not F; therefore A is not B, and X is not Y. Thus,

"If the world existed from eternity, there would be no records respecting its commencement;
If it was produced by chance, it would not bear marks of design:
But there are records respecting its commencement; and it does bear marks of design; therefore,
It neither existed from eternity, nor is the work of chance."

These arguments are generally called Dilemmas, but they differ very little from simple conditional syllogisms, two or more being expressed together, because in these cases you *wholly* deny the consequents. But when you have several antecedents with each a different consequent, and when you *disjunctively* deny them in the minor premise, instead of *wholly* denying them, as in the last example, and then in the conclusion *disjunctively* deny the antecedents, in that case the Dilemma is properly destructive. For example; If A is B, C is D; and if X is Y, E is F: but either C is not D, or E is not F; therefore, either A is not B, or X is not Y. Thus,

"If this man were wise, he would not speak irreverently of Scripture *in jest;*
If he were good, he would not do it in *earnest:*
But he does speak irreverently of the Scriptures, either in jest, or in earnest; therefore,
He is either not wise, or not good."

In these examples we have stated the arguments at length, and arranged the parts of which they consist in separate lines, in order that it may be at once seen how easily they can be reduced to two or more simple conditional syllogisms. Take for example the above Destructive Dilemma; it may be reduced to Destructive Conditional Syllogisms; thus,

"If this man were wise, he would not speak irreverently of Scripture in jest:
But he does thus speak irreverently of Scripture; therefore,
He is not wise."

Again:

"If this man were good, he would not speak irreverently of Scripture in earnest:
But he does thus speak irreverently of Scripture; therefore,
He is not good."

A Constructive Dilemma may also be reduced in the same way to two or more Constructive Conditional Syllogisms. Thus, in the example given above, we may say, "If Æschines joined in the rejoicings, he is inconsistent: but he *did* join in them; he is therefore inconsistent." Again, we may say, "If he did *not* join in them he is unpatriotic: he did *not* join in them; therefore he is unpatriotic." Now in all correct Dilemmas an opponent may deny *either* of the minor premises, but he cannot deny *both;* hence he must admit one or other of the conclusions; because when a Constructive

Dilemma is employed, it is supposed that *some one* of the antecedents must be true; and when a Destructive Dilemma is used, that *some one* of the consequents must be false. As they cannot, therefore, be both admitted, or both rejected, the opponent is left to choose which he likes, and in either case he is confuted. He is thus caught on the horns of the Dilemma whichever way he turns. This kind of argument can be applied to all subjects, and is often used in Mathematical demonstrations. Nothing is more common with *Euclid*, when about to shew the equality of two given figures, or, which is the same thing, to prove the absurdity of asserting them to be unequal, than to adopt this mode of argument, *that if they are not equal, the one must either be greater or less than the other;* and then having destroyed both these suppositions, on which alone their inequality can rest, he proves that they *are* equal to each other. By reducing the Dilemma to the several syllogisms of which it consists, and by applying to them the rules laid down for ascertaining their validity, we shall be taught how to use, and how to judge of these arguments.

4. *The Epichirema.* This is a syllogism which has to one or both of the premises the proof immediately subjoined. It is often desirable that each proposition in an argument should be clearly established before we advance to the next step in the reasoning, in order that we may carry conviction with us as we move on to the conclusion. This is often necessary in didactic and argumentative compositions, in public ad-

dilesses, and in common conversation; in these cases we subjoin the proof of the premises as we announce them, and then afterwards draw the conclusion. Sometimes it may be deemed necessary to subjoin the proof to both premises; in other cases it may be unnecessary to prove more than one of them, the other being self-evident, or admitted; but in either case the syllogism is called an Epichirema, because the proof is thus furnished to the hand. Thus,

"Every thing is a blessing to men that leads them to prepare for eternity; because in so doing they act wisely—secure their present peace—and promote their best interests:

But affliction often leads men to prepare for eternity; because it disposes to serious thought—weans them from the world—and leads them to attend to divine things; therefore,

Affliction is sometimes a blessing to men."

The Orations of Cicero afford many examples of this form of syllogism. His oration in defence of Milo who had slain Clodius, has been noticed as a very happy instance. His major proposition is, that it is lawful for one man to kill another who lies in wait to kill him; this he proves from the custom of nations, from natural equity, and by examples. His minor proposition is that Clodius laid in wait for Milo; this he proves from his arms and guards: and then he draws his conclusion, that it was lawful for Milo to kill Clodius.

Sometimes the major proposition is self-evident, while the minor only needs confirmation: in this case it will be sufficient to prove the latter; thus,

"All useful studies deserve encouragement:
Logic is a useful study, because it assists us to detect error, and to reason accurately; therefore,
Logic deserves encouragement."

The minor premise in this last example, and both the major and minor in the other instances of the Epichirema given above, are evidently *enthymematic*, and may be formed into regular syllogisms, as was shewn when treating of the Enthymeme. Although this abbreviated mode of reasoning is so commonly used, it can be so easily thrown into the syllogistic form, that it scarcely needs any explanation.

5. *Induction.* This is merely an abridged mode of stating an argument, which, when drawn out in due form, is purely syllogistic. By this method of arguing we infer *universally* concerning any subject that which we had before affirmed or denied *separately* of all its individual parts or subdivisions. Thus, if we suppose the whole tribe of animals subdivided into men, beasts, birds, insects, and fishes, and then reason concerning them in this way; "All men have a power of beginning motion; all beasts and birds have this power; all insects and fishes have this power; therefore, all animals have a power of beginning motion;" this argument is called an *induction.* When the subdivisions are just, and the enumeration perfect, the *in-*

duction is complete, and the reasoning is evidently conclusive. The above argument, however, is nothing more than a string of syllogisms in *Barbara*, expressed in this abridged manner, which can so easily be reduced to regular syllogisms, that it is not necessary to dwell on them.

CHAP. IX.

OF FALLACIES.

We must now turn our attention to the nature and varieties of fallacious reasoning. Any unsound mode of arguing, which appears to demand our assent, or to be decisive of the question in hand, when in fairness it is not, is called a *Sophism*, or a *Fallacy*. The name *Sophist*, which is given to persons who knowingly adopt this fallacious mode of arguing, was not originally considered a term of reproach. It was given to those who were renowned for their wisdom, or for their skill in any of the arts and sciences; and had then nearly the same signification that *Philosopher* has at the present day. But when the art of wrangling took possession of the schools, and disputants arose whose only object was to entangle their opponents, and who contended for victory, not for truth, this name became their appropriate title; and the fallacious arguments which these persons used were called sophisms. As this method of reasoning is still pre-

valent, and is the fruitful cause of numerous errors, it is of great moment that we become acquainted with the doctrine of Fallacies;—not that we may practise them, but that we may learn how to detect and expose them. We shall, therefore, arrange them under distinct heads, analyse the process that takes place in each, and point out the fallacy that lurks in them.

Fallacies have been arranged by Aristotle into two great classes; those in the words, and those in the matter; the former he denominated *Fallacia in Dictione*, and the latter *Fallacia extra Dictionem*. It is perhaps impossible to form any division of Fallacies that shall be perfectly free from objection; or to lay down any rules that can be applied with mechanical readiness and certainty in detecting and exposing them. The elliptical form in which all reasoning is usually expressed, and the involved and oblique manner in which a fallacy is generally conveyed, render it sometimes doubtful, or at least a matter of mere arbitrary choice, to which class it should be referred. Still it is of importance to classify and describe these erroneous modes of arguing; and although, in the practical detection of them, much must of course be left to natural and acquired acuteness, still, a correct view of the subject will be of material service.

In every Fallacy the conclusion either does, or does not follow from the premises. Where the conclusion does *not* follow from the premises, it is evident that the fault is in the reasoning. All fallacies of this kind must therefore be considered Logical, because they

violate the rules of Logic; and their fallaciousness is exhibited by the mere *form* of the expression, without any regard being paid to the meaning of the terms. In other cases the fallacy lies concealed in the ambiguity of the middle term; and though in such cases it is seen, by the rules of Logic, as soon as the ambiguity of the middle term is ascertained, that the conclusion does not follow from the premises, yet to ascertain this ambiguity attention must be paid to the *subject-matter*, or to the *sense of the term*. In these cases, then, Logic only teaches us where to look for the fallacy, and on what principles to condemn it when it is ascertained, without pretending to be able, by any multiplication of rules, to determine the full and exact meaning of the terms that may occur. These fallacies, then, are only *partly* Logical; and all that can be done, in such cases, is to give some general rules that may be of service in reference to them. Fallacies of this kind we, therefore, denominate Semi-logical. On the other hand, when the conclusion *does* follow from the premises, we may still be deceived by the assumption of false or doubtful premises, or by a conclusion being drawn which is irrelevant to the subject. All fallacies of this kind are *material;* they take place in the *subject-matter* of reasoning, not in the *reasoning process*. They are therefore called Non-logical; and although it is vain to expect that any system of rules will enable us clearly to ascertain the meaning of every term, and the truth or falsity of every proposition, still, even in these cases, much assistance may be gained from

logical rules, and from the mental habits which a diligent study of them tends to produce. We shall therefore first consider those fallacies that are *Logical;* secondly, those that are *Semi-logical;* and thirdly, those that are *Non-logical.*

Section I.

Of Logical Fallacies.

The rules already laid down will enable us to detect the fallaciousness of all apparent arguments in so far as the mere form of the expression is concerned. If we have an undistributed middle; or an illicit process of the major or minor; or negative premises; or an affirmative conclusion from a negative premise, or the contrary; or if there are evidently more than three terms, we shall be able, by the preceding rules, at once to detect and expose the fallacy. When these false arguments are singled out, and individually made the subject of careful examination, it is comparatively an easy work to detect the sophistry that lurks in them. But it must be remembered that fallacies most frequently occur in extended discussions, expressed in an elliptical and disguised manner; and that every effort is used by the Sophist to conceal the weakness of his arguments, and to draw away attention from them. Nothing, then, will be so serviceable in detecting real logical fallacies, as a thorough knowledge of the rules

on which all just reasoning depends, and good sense and ability in applying them with promptness and accuracy.

Of course it would merely be repeating what has already been laid down, were we to illustrate pure logical fallacies by examples. But there is one mode of fallacious reasoning which may with great propriety be referred to this head. We refer to that common error of supposing the *conclusion* false, because the *argument* is unsound; or of supposing the *premises* true, because the *conclusion* is a truth. If any person argues for the existence of a God from its being universally believed, another might perhaps be able to refute the argument by producing an instance of some nation destitute of this belief. The argument in this case ought to *go for nothing;* but it will be thought by some that it ought to go much farther. They suppose that it has *disproved the existence of God,* while it has only destroyed an unsound argument. In this case the person is guilty of violating the laws of correct argumentation, which will be at once seen by an examination of his reasoning. His argument expressed at length stands thus:

"Whatever is universally believed must be true:
The existence of a God is not universally believed; therefore,
The existence of a God is not true."

But this syllogism is a mere fallacy, because we have here an *illicit process of the major.* We have

the term "true" distributed in the conclusion, by being the predicate of a *negative proposition*, while it is not distributed in the major premise, being there only the predicate of an *affirmative proposition*. The argument is, therefore, unsound.

Again: were any person in this instance to argue from the truth of the *conclusion* to the truth of the *premises*, the reasoning would still be fallacious. Thus,

"Whatever is universally believed is true:
The existence of a God is true; therefore,
The existence of a God is universally believed."

In this case we have the Fallacy of *an undistributed middle*; because the middle term "true" is neither the subject of a universal, nor the predicate of a negative proposition. The argument is therefore inconclusive.

When the conclusion is a known truth, it is sometimes very difficult to perceive any fallacy in an apparent argument; and when it is discovered, it is often difficult to expose its fallaciousness, especially to those who are unacquainted with the reasoning art. Perhaps in such cases the best mode is to bring forward a similar fallacy, the conclusion of which is obviously absurd, and in this way expose and refute the unsound argument. There are many who would not perceive any fallacy in the following erroneous argument, especially if enveloped in a cloud of words:

"Every rational agent is accountable:
Brutes are not rational agents; therefore,
Brutes are not accountable."

But this apparent argument corresponds exactly with the following, the absurdity of which all will immediately perceive and admit:

"Every horse is an animal:
Sheep are not horses; therefore,
Sheep are not animals."

Again:

"All wise legislators suit their laws to the genius of their nation:
Solon did this; therefore,
Solon was a wise legislator."

This unsound argument corresponds exactly with the following, the absurdity of which is manifest:

"All vegetables grow:
An animal grows; therefore,
An animal is a vegetable."

These fallacies evidently do not conform to the laws of correct reasoning. In the one case we have an *illicit process of the major*, in the other a *non-distribution of the middle term*. In all these cases the fallacy is evident at once from the mere *form* of the expression, without any regard being paid to the meaning of the *terms*. This may be seen by substituting mere symbols for these propositions; thus,

"Every Y is X; Z is not Y; therefore, Z is not X."

Again:

"Every X is Y; every Z is Y; therefore, Every Z is X."

These, therefore, are evidently pure Logical Fallacies.

Section 2.

Of Semi-logical Fallacies.

There are, however, many apparent arguments, the fallaciousness of which cannot be perceived by the mere form of the expression. They are couched in equivocal or ambiguous terms, and the fallacy can only be detected and exposed, by a careful examination into the *sense* of the terms employed, and by removing their ambiguity. This it must be confessed is the most fruitful source of error in reasoning; and as it is impossible that any system of rules can be devised which can clear up the ambiguity of every term, numerous complaints have been made against Logic, that it leaves the greatest difficulty in reasoning unprovided against. But it must ever be kept in mind that the proper business of Logic is with the *laws of correct Reasoning*, and that it treats of *Terms* and *Propositions* only in a secondary way, and in subserviency to this its principal object. Some of its friends may have excited expectations which they could never realize, by laying down "rules for attaining clear ideas," and for "guiding the judgment in the search after truth;" but no system can ever be devised that can perform what these persons have attempted. Yet Logic, al-

though it cannot perform impossibilities, may nevertheless materially aid us in this important matter. It cannot clear up the ambiguity of every term, but it can teach us where to look for the ambiguity. Hence we find it directs us to the *middle term*, as the one in which the ambiguity which contains the fallacy is most likely to be found. In this case Logic teaches us not how to find the fallacy, but where to seek for it, and on what principles to condemn it when it is discovered. The fallacies that come under this head are not therefore properly logical, because the form of the expression may comport with the laws of correct reasoning, while the sophism lurks in an ambiguous term. To discover this ambiguity attention must be paid principally to the *subject-matter* of reasoning, not to the reasoning process. Hence the fallacies that come under this head are called merely semi-logical; and to this class are to be assigned all those cases in which the middle term is ambiguous.

In real logical fallacies the extremes are compared with *two parts of the same term;* but in those now to be considered they are compared with *two different terms*, because the middle term is used in different senses in the two premises. Now, although the rules of Logic cannot alone clear up this ambiguity, they can point out where it is likely to be found, and thus materially aid us in detecting and exposing it. It will be useful, then, to classify and describe the different kinds of ambiguity that are likely to be met with, and to point out the fallacies to which they give rise.

It is certainly a much easier task to give examples of the various fallacies, than to detect them in ordinary practice. In the former case they are detected already; and by placing the two premises in juxta-position, their absurdity appears evident, even to the inattentive and illiterate. But in common practice the premises are generally kept at as great a distance as possible from each other; the weak part is carefully concealed; and the whole is enveloped in a cloud of words, that renders deception comparatively easy. Although, then, the examples that will be given below may appear so evident that they could scarcely impose on the most unwary, and although it may seem almost trifling to point them out, or dwell upon them, yet to classify and describe these fallacies is not so unimportant as some have attempted to represent. The mental habits thus formed are of immense advantage; an acquaintance with fallacious reasoning will put us on our guard; and prevent us from either using it ourselves, or from being imposed on when is it employed by others. We proceed, therefore, to enumerate and describe the semi-logical fallacies. Of these the most important are the following:

1. *Fallacia equivocationis.* This fallacy takes place when one of the terms in an argument has *in itself*, from its own equivocal nature, two significations. Thus,

"The dog barks:
But the dog is a star; therefore,
A star barks."

In this case we have an ambiguous middle term, which is used in different senses in the two premises. When the argument is thus stated in the form of a regular syllogism, the absurdity is so striking, from the two premises being placed so near each other, that no person can be deceived by the fallacy. Hence the mere mention of this sophism has often drawn down plentiful abuse on the logician, as if he were occupied with trifles, unworthy of attention. But it should be remembered that in practice these two premises are generally placed far apart, and the gliding from the one sense of the equivocal term to the other is generally managed in a disguised and dexterous manner, so that the ambiguity of the middle term is overlooked. In all cases, then, it is of the utmost importance that we particularly examine the principal *terms* of an argument; when a habit of this kind is once formed, we are not likely to be imposed on by the fallacy of equivocation.

2. *Fallacia amphiboliæ.* This happens when a sentence employed in reasoning is capable of two meanings, not from the double sense of any of the terms, but from its admitting of a double construction. This fallacy can scarcely be exemplified by any regular syllogism expressed in the English language, as the genius of the tongue, when a definite argument is proposed, scarcely admits of this construction. But nothing is more common than this fallacy in ordinary writing, in which some word or words may be referred either to the former or to the latter clause of a

sentence, and thus two very opposite meanings are conveyed. The heathen oracles of old afford us many examples of this ambiguity; similar to which is the witch prophecy in Shakspeare,

"The Duke yet lives that Henry shall depose."

In this sentence the meaning may either be, that the Duke lives who shall depose Henry, or whom Henry shall depose. When propositions of this kind occur in reasoning, they often cause much confusion and error. The fallacy, however, can easily be detected by paying close attention to the different meanings which the sentence can bear; and all arguments founded on the ambiguity of such propositions may be shewn to be erroneous, by pointing out the four terms of which, when drawn out into regular syllogisms, they will be found to consist.

3. *Fallacia compositionis.* This species of fallacy consists in assuming that to be true *collectively* which is so only *distributively*. Thus,

"Two and three are an equal and an unequal number:
Two and three are five; therefore,
Five is an equal and an unequal number."

Again:

"Three and two are two numbers:
Five is three and two; therefore,
Five is two numbers."

In these examples the middle term is evidently am-

biguous, being used in *the major premise collectively*, and in the *minor distributively*. For instance, in the last example, the middle term is ambiguous, because "three and two" are taken *distinctively* in the major premise; and in this sense that which is affirmed respecting them is evidently true: but in the minor they are *taken together*, and in this sense what is affirmed of them is evidently false.

This is a fallacy that prevails to a great extent in the transactions of every day, and there is scarcely any other with which men are more likely to deceive themselves. Many have been induced to indulge in games of hazard to their utter ruin by imposing on themselves by this fallacy. They have reasoned thus:

"What is no uncommon occurrence may reasonably be expected:
To be successful in play is no uncommon occurrence; therefore,
To be successful in play may be reasonably expected."

In this reasoning the middle term is evidently ambiguous; because, for the major premise to be true, the middle term must be understood as referring *to some one individual;* for the minor to be true, it must be understood as spoken of *some one or other;* in the conclusion, as it is applied in practice, it must be understood in the sense of being "reasonably expected *by a certain individual.* We have here, then, the fallacy of Composition, supposing that to be true in

reference to every person who engages in play, which is only true of some individual. The fallacy evidently lies in the ambiguity of the middle term, and may be exposed by shewing that there are in reality two middle terms, with which the premises are compared.

The form in which this fallacy is most commonly employed, is to establish *separately* some truth concerning each single member of a certain class, and then to infer the same of the whole *collectively*. Thus infidels have laboured to prove concerning *some one* of the miracles recorded in the Scriptures, that it might have been the result of some accidental conjunction of natural causes; then they infer the same respecting *another;* and so on; till at last they infer that thus it might have been respecting them *all*. But this is the same as if they were to argue thus: "It is not very improbable one may throw sixes in any one out of a hundred throws; therefore it is no more improbable that one may throw sixes a hundred times running."

4. *Fallacia divisionis.* This fallacy is nearly allied to the preceding, being merely the reverse of it; and takes place consequently when we affirm of any thing *distributively* what is only true of it *collectively*. For example;

"All the angles of a triangle are equal to two right angles:
A B C is an angle of a triangle; therefore,
A B C is equal to two right angles."

Again:

"Five is one number:
Three and two are five; therefore,
Three and two are one number."

In this case, in the *major premise*, the middle term is taken *collectively;* and in the *minor*, it is taken *distributively*. It is therefore merely the reverse of the preceding, and may be detected and exposed in the same way.

This fallacy often turns on the ambiguity of the word "all," which may however be dispelled by substituting for it the word "every," or "each," where that is its true signification. Sometimes "all" is taken in a *collective* sense in the major premise, while a conclusion is drawn which requires that it should be taken in a *distributive* sense. Thus,

"All the musical instruments in the Jewish Temple made a noble concert:
The harp was an instrument in the Jewish Temple; therefore,
The harp made a noble concert."

Again: this fallacy takes place, when the word "all" is made in one premise to refer to a *species*, and in the conclusion to *individuals*. Thus,

"Nothing that was in Noah's ark perished in the flood:
All animals were in Noah's ark; therefore,
No animals perished in the flood."

The fallacy in this case may be dispelled by shewing that in one case the reference is to all *kinds* of animals; in the other, to individuals only.

5. *Fallacia figuræ dictionis.* This fallacy takes place when a term is introduced in an argument which resembles in *sound* the one for which it is substituted, but not in *sense*. Men generally take for granted that *paronymous* words, that is, those which resemble each other, which have the same root, or are connected with each other by the grammatical affinity of language, must have a correspondent meaning. This, however, is by no means the case universally; and when a term is introduced which appears to be equivalent, when in reality it conveys a very different meaning, the Sophist easily succeeds in his deception. It is scarcely possible to exhibit, in strict logical form, a fallacy of this class, which is at all likely to impose on persons possessed of merely moderate shrewdness; because, by doing so, it would be seen at once to have two middle terms in sound as well as in sense. Yet nothing is more common in practice than this fallacy. The terms employed in any lengthened argument are continually undergoing a change, in order to afford pleasing variety, or to subserve the purposes of taste or convenience; and provided the *meaning* is preserved unaltered, this is not to be deemed a fault, but a beauty in composition. No objection can be justly made to the following syllogism, although there is a considerable alteration in the terms employed:

"Murder should be punished with death:
This man is a murderer; therefore,
He deserves to die."

In this case the changes that are made are perfectly allowable; because they proceed on the just assumption, that to commit murder, and to be a murderer,—to deserve death, and to be one who ought to die,—are, respectively, precisely equivalent expressions. This kind of liberty is perfectly allowable; and to be deprived of it would often prove a very great inconvenience. But the fallacy which we are now considering consists in the abuse of this liberty; as may be seen by the following example:

"Projectors are unfit to be trusted:
This man has formed a *project;* therefore,
He is unfit to be trusted."

Here the fallacy lies in insinuating that he who forms a *project* must be a *projector;* although the sense commonly attached to the latter word, is not at all implied in the former. They are indeed derived from the same root, and resemble each other in sound, but cannot on any account be admitted into an argument as equivalent expressions.

Sometimes this fallacy lurks not in the ambiguous middle term, but in one of the terms of the conclusion. In this case the conclusion that is drawn will not be at all what the premises warrant, although it may seem to be so, by the resemblance which the term artfully brought in appears to have to the one for which it is substituted. Thus,

"To be acquainted with the guilty is a *presumption* of guilt:
This man is acquainted with the guilty; therefore,
We may *presume* that he is guilty."

The fallacy in this case proceeds on the supposition that there is an exact correspondence between *presume* and *presumption*. This, however, is not a just supposition; because "presumption," in the one premise, means evidently only a kind of *slight suspicion*; whereas "to presume" is used in the other, as it is commonly employed, to express *absolute belief*.

There are innumerable instances in which words are thus supposed to have exactly the same meaning, when in reality this is a false assumption, which may lead to very serious error. And the more slight the variation, the more likely is the fallacy to deceive, because persons are thereby thrown more off their guard. In order to detect these fallacious arguments, it is of great moment that we endeavour, by every means in our power, to obtain a correct knowledge of words, in all their varieties and shades of meaning, and more particularly that we become acquainted with synonymes and pseudo-synonymes, as an accurate acquaintance with them will be of the greatest service in detecting these fallacies. In order to refute them, after they have thus been detected, we must point out the different meanings which the words bear; and, by varying the construction, so that it may agree with the one word but not with the other, shew that in the case in hand they are not synonymous.

Sometimes this fallacy arises from a word being used at one time in its *customary*, and at another, in its *etymological* sense. Thus it has been argued that it is idle to speak of eternal or immutable "*truth*," because this word is derived from "to trow," that is, *to believe*. Assuming that its right meaning must correspond exactly with the strict, original sense of this verb, it has been contended that the one must be as fluctuating as the other. The best way to expose this kind of sophism is to bring forward another, founded on the same principle, the absurdity of which will be at once manifest. Thus in reference to the above fallacy it has been well replied, that the Sophist might have censured on as good grounds the absurdity of a person's saying he had sent a letter by the "*post*;" because a post, in its primary sense, is a pillar; or have insisted that "Sycophant" can never mean any thing but "Fig-shower."

As this Fallacy is sometimes founded on the *etymology*, so is it frequently on the *prosody* of a language. In some languages the *accent* often completely alters the signification of a word. Thus in the Latin words *occĭdo* and *occīdo*, the meaning is completely changed, according as you put the short or the long accent on the penultima. In the Bengalee language there are many words which so nearly resemble each other, that the slightest change in the pronunciation will completely alter the meaning. Thus the words গরু, গুরু, have a meaning very distinct from each other, although the slightest inaccuracy in pronunciation may

lead to very awkward mistakes respecting them. The same may be remarked of numerous provincialisms in the English language. In some parts of Scotland there are many words which, in common conversation, seem to have made a fair exchange of significations; thus, in many places, *plum* and *plume* have fairly exchanged meanings; the *former* being applied to an ornament of feathers, which is the correct meaning of the latter; and the *latter* being given to the delicious fruit which bears the name of the former. Now, sometimes the Sophist seizes on these distinctions, trifling though they may seem, and makes them the foundation of his fallacious reasoning; and although the mere directing the attention to these cavils is sufficient to refute them, it is astonishing how much they sometimes mislead the unthinking multitude. In all these cases an *ambiguous middle* is the cause of the Fallacy.

6. *Fallacia accidentis.* This fallacy takes place when a person argues for or against anything, from what is merely *accidental*, instead of from what is *essential* to the subject. For example, were any person to object to the doctrine of fallacies, that the study of it is dangerous, because it furnishes the Sophist with weapons for his fallacious disputations, this would be a fallacy that might properly be referred to this class; since it is arguing against a useful branch of study, merely because it may happen to be abused. Such a sophism may be easily refuted by pointing out the difference that exists between the thing itself, and the mere accidental concomitants against which the objection is made.

This mode of fallacious reasoning must also be referred to an ambiguous middle. The middle term is used in one premise to signify something considered *as to its essential properties;* and in the other premise, it is considered as implying that its *accidents* are taken into account with it. Thus,

"What is bought in the market is eaten:
Raw meat is bought in the market; therefore,
Raw meat is eaten."

In this instance the middle term, in the major premise, is understood, *as to its essential properties;* in the minor, *as to its condition and circumstances.*

Again:

"Christianity existed from the days of the Apostles:
Protestanism did not exist from the days of the Apostles, but only from the time of Luther; therefore,
Protestanism is not Christianity."

This is evidently a fallacy; and the error lies in insinuating that what is true of any subject considered simply in itself, must be true likewise of it in all its particular modifications. It is true, as stated in the major premise, that Christianity existed from the days of the Apostles; but it is not true, as is *implied* in the minor, that all its possible accidental circumstances existed from that time also. This ambiguity is the cause of the fallacy; and by pointing it out the sophism will be detected. Perhaps a fallacy of this

kind may be most effectually refuted, by bringing forward another, on a similar principle, the absurdity of which will be at once manifest. Thus,

"Lord Auckland existed last century:
The present Governor General of India did not exist last century, but only from the time of his appointment to this high office; therefore,
Lord Auckland is not the Governor General of India."

By thus bringing forward a parallel case, all such sophisms may be, in a popular manner, triumphantly refuted.

7. *Fallacia a dicto secundum quid ad dictum simpliciter; aut vicissim.* This fallacy is nearly allied to the preceding, and takes place when any person argues for a thing taken in an *absolute sense*, when it is only true in a *restricted sense;* or the contrary. The examples given of it are like the following; "An Ethiopian is white as to his teeth; therefore, he is white." "A man in particular circumstances acted prudently; therefore he will act prudently in all circumstances." Or thus;

"Prodigies and omens are not to be believed:
Livy in his Roman history describes omens and prodigies; therefore,
Livy's Roman history is not to be believed."

All these fallacies can be easily solved by shewing that a thing may be true in some respects, while it is not so in others; or that it may be true considered

simply in itself, while it is not so abstracted from these circumstances.

Again: this fallacy may take place by a person's arguing from what is true *absolutely*, to prove the same thing true in *particular circumstances:* thus,

"All men have a right to their personal liberty:
A madman is a man; therefore,
He has a right to his personal liberty."

The fallacy in this case is nearly the same as the *fallacia accidentis*. The sophism lurks in the ambiguity of the terms, and may be exposed by shewing the difference that exists betwixt things in their absolute nature, and as necessarily modified by special times, places, and circumstances.

8. *Fallacia plurium interrogationum.* This fallacy consists in asking several questions, which appear to be but one, in such a way, that whatever *one* answer is given, being of course applicable to only *one* of the implied questions, may be interpreted as applied to some one of the others. Thus, if asked, "Are virtue and vice desirable?" Whether you reply, Yes, or No, you are equally entangled. If, however, you reply to each question separately, you detect the ambiguity and expose the fallacy.

If the several questions that are proposed together, are avowedly brought forward as *distinct* questions, there is no fallacy in the case; for it is just as fair to put two or more distinct questions in this way, as it is to assert a string of distinct propositions, connected

together by the laws of grammar. It is only when the questions are put in such a way as shall elicit *one* answer to the whole apparent question, which can only be correctly answered by several, that this Fallacy is employed.

Sometimes the fallacy turns on some *equivocal term* artfully introduced into the question. Nothing gives so much life and apparent force to sophistical reasoning as to state one of the premises of an argument in the form of a question; and then, presuming that it is admitted, to fill up the rest of the argument as may best suit the person's purpose who is desirous to deceive. If, then, one of the terms in that question be ambiguous, whichever sense the opponent takes up and replies to, the Sophist assumes the *other* sense in the argument which he uses in reply. Thus if it be asked, "Is anything vicious expedient?" whatever answer is given to this question, whether in the negative, or the affirmative, a fallacy may be founded upon it, from the ambiguity of the term *expedient*. Sometimes this term means "conducive to temporal happiness;" sometimes "conducive to the greatest good." If the answer be in the *negative*, then the Sophist might argue thus;

"Whatever is vicious is not expedient:
Whatever conduces to temporal happiness is expedient; therefore,
Whatever conduces to temporal happiness is not vicious."

If the answer be in the affirmative, he may reason thus;

"Whatever is expedient is desirable:
Something vicious is expedient; therefore,
Something vicious is desirable."

In these cases care must be taken to find out where the ambiguity lies; and by exposing it, the fallacy will be dissipated.

This fallacy sometimes take place also by employing a term in a question, in such a way, that it may be uncertain whether it is *distributed* or not; so that here again, whatever answer is given, the reply may be misrepresented and disproved. For instance, if it be asked, "Did Constantine embrace Christianity from a conviction of its divine origin?" the meaning may either be, "was this his *sole* reason for doing so?" or "was this only *one* of his reasons?" In the first case, the term is considered as distributed; in the other, not; and whatever answer is given may be perverted by the Sophist.

In all the above classes it will be evident, from a careful examination of each of them, that the fallacy lurks in *ambiguous terms*. They are therefore all placed under the head of Semi-logical Fallacies. It must, however, often be a matter of mere arbitrary choice to which of these classes any individual Fallacy should be assigned.

Section 3.

Of Non-logical Fallacies.

The Fallacies now to be considered are those in which the Conclusion *does* follow from the premises. In the other two classes the fallacy lurked, in some way or other, in the *connection* which the conclusion had with the premises. In this class, however, the connection between these is correct; the one follows justly from the other; and the sophism is to be found neither in the violation of logical rules, nor in the ambiguity of equivocal terms. The fallacy of the present class of arguments must be sought for either in the *Premises* that are assumed, or in the *Conclusions* that are drawn from them. They are therefore fallacies *Extra Dictionem*. In this case the fallacy consists not in the process of reasoning, nor in the ambiguity of the terms, but in the *matter* about which the argumentation is taking place. Such Fallacies are therefore called *Non-logical*, because no rules which Logic lays down can themselves enable us to detect and expose them. Under this head all those Fallacies may be ranged, which result from the *Premises* being unduly assumed, or the *Conclusion* not being the one required. The following may therefore be specified.

1. *Fallacia non causæ pro causa.* This fallacy consists, as it is generally expressed, in assigning an event to a wrong cause—an error into which men have always been prone to fall. Many of the doctrines

of ancient philosophy are reduceable to this head; as, for instance, when the Peripatetics gravely informed us, that "nature was terribly afraid of a vacuum, and that this was the cause why water would not run out of a long tube, if it were turned upside down."

This fallacy prevails to a great extent among the ignorant and superstitious. If a comet appears, or an eclipse of the sun or moon takes place, it is customary for them to look upon these natural phenomena as the forerunners of wars, pestilence, and famine. If a person has been guilty of some crime, and shortly after meets with some temporal calamity, the one is at once made the cause of the other. On the other hand, if a person is involved in a series of afflictions, they immediately conclude that these are judgments come upon him for his iniquities. But all these conclusions are mere sophisms, without any solid basis on which to rest.

Many of the popular objections brought against Christianity are to be referred to this head. All the persecutions that have been the disgrace of the professed Christian church; all the numerous sects and parties into which the Christian world is divided; all the inconsistences and wickedness of those who have no other claim to be considered Christians, but that they have unrighteously assumed the name; these are often brought forward in such a way as to insinuate, that the whole is justly chargable on Christianity itself; although any person that looks at the Christian religion, as it is revealed to us in the Sacred Volume,

must at once perceive the fallacy of such insinuations. In this case the Sophist, generally speaking, contents himself with merely *insinuating* his unfounded objections; for there are few who will come forward and directly charge Christianity with these flagrant evils. But what fair argument cannot do, a sneer, and a smart innuendo, may often accomplish; and the fallacy imposes even on those who plume themselves on their superior understanding, and freedom from all vulgar prejudices.

If we analyse the process that takes place in this fallacy we shall find that that which chiefly distinguishes it is the undue assumption of one of the premises. In reasoning from cause to effect two things are necessary; we must first shew the *real existence* of a sufficient cause; and then we must prove that this is *the* cause that is in operation in this particular instance. These are the two premises in this kind of argument. If, then, either of these premises is unduly assumed, this fallacy takes place. Thus; if one should contend from another person's being unjust and cruel, that he will certainly be visited with some heavy temporal calamity; in this case, he assumes a pretended *cause* in the premises, and then he infers in the conclusion that the supposed effect will certainly follow. Or, on the other hand, if a person has been involved in some grievous temporal calamity, how common is it to infer that he must have been peculiarly guilty; more so, at least, than those who have not been visited with the same distress. In this case the

pretended *effect* is employed to establish the supposed cause. In both these instances the fallacy lies in assuming a premise without having proper authority for so doing. In the one case a fact that really exists is supposed to he the *cause* of something that is only expected; and in the other, a fact that really exists, is assumed to be the *effect* of something which is only *supposed* to have an existencc. In the one case the Sophist takes for granted a *cause*, in the other an *effect*; without either heing self-evident, or satisfactorily proved.

Sometimes, when both the *pretended* cause and effect are granted, that is, when they both really exist *as facts*, the fallacy lies in assuming a *connection* hetween these facts, when there is no such thing. Thus, if a patient takes a particular medicine, and recovers, how common is it to affirm that he *was cured* by this medicine. In this case the two facts are incontrovertihle; the patient took the medicine; and he recovered; hut more than this we are not warranted to affirm. The Sophist, however, will go much farther; he will assume that, of these two admitted facts, *the one is the cause of the other*, and thus he guilty of a "*non causa pro causa.*" In all these cases, however, the fallacy lies in the undue assumption of some premise that is doubtful, or unsupported.

When a premise is thus unduly assumed, the great object with the Sophist is to prevent the undue assumption from heing perceived; for as soon as this is discovered the fallacy is detected. Very often the

doubtful premise is suppressed, as if it were too evident to need proof, or even to be stated. Thus a Sophist might affirm; "there will be war this year, because a comet has appeared;" and this argument might appear to the ignorant and superstitious sufficiently conclusive; because the other premise, which is manifestly false, is kept out of view. Let the suppressed premise be directly asserted, and there are few who would be imposed on by the fallacy. Thus,

"Whenever a comet has appeared, a war has taken place:
A comet has appeared this year; therefore,
There will be a war."

By merely mentioning the argument in this way, the attention is aroused, and the mind is led to consider whether the assertion is *true* or not; and as the person may recollect instances in which such an event took place, without being attended with this sad consequence, he begins to doubt the assertion, and then very soon discovers wherein its fallacy lies.

There is another form of this fallacy by which we may often be deceived; we refer to the very common practice of attributing to a proposition that is really probable, a *greater degree* of probability than rightly belongs to it. This often takes place when, in a long chain of argument, we omit to calculate the probabilities in each successive step. Each step may have an excess of chances in its favour, and yet the ultimate conclusion may have a great preponderance against it. This has been illustrated as follows;

"All Y is probably X:
All Z is probably Y; therefore,
All Z is probably X."

Now, supposing the truth of the major premise to be more probable than otherwise; admit that the chances for it are more than $\frac{1}{2}$; say $\frac{4}{7}$; and suppose the chances for the truth of the minor to be greater still; say $\frac{2}{3}$; then, by multiplying together the numerators and the denominators of these two fractions, $\frac{4}{7} \times \frac{2}{3}$, we obtain $\frac{8}{21}$, as intimating the degree of probability that belongs to the conclusion. This, however, is less than $\frac{1}{2}$: the conclusion, then, is *less* likely to be true than the two preceding steps in the argument. For example:

"The reports which this author heard are probably true:
This which he records is a report which he heard; therefore,
This statement is true."

Suppose the *majority* of the reports he heard, say *four out of seven*, are true; and that he *generally*, say, *twice in three times*, reports faithfully what he heard; it follows that of *twenty-one* of his reports, only *eight* are true. When there is a long chain of argument of this description, of course the results are equally striking. And yet how often are persons deceived by hearing a long chain of probabilities brought forward in support of some conclusion; whereas each successive link in this chain is weaker than the one that preceded.

The examples given above refer to that form of this Fallacy which is called "*a non vera pro vera.*" There is another form, however, which it sometimes assumes, which has been called "*a non tali pro tali.*" This takes place when a person argues from a case *not parallel* as if it were parallel. Thus, from the circumstance that some persons have abused charity, it has been contended that to give alms, in any case, is improper. Because a person from a particular class of society, when raised to a station of trust and importance, has acted improperly, it has been argued that to raise any other of that class to the same station, must be attended with similar ill-success. But in cases of this kind, the argument rests on the assumption of a prefect *parallelism* in the two cases; whereas there may be some circumstances, absolutely essential, lost sight of, which may vitiate the whole reasoning.

This Fallacy, in all its various modifications, consists in having one or other of the premises *false*, that is, unduly assumed. In the "*non tali pro tali.*" the *suppressed premise is false*, for it is in this premise that the parallelism is affirmed. And in the "*non vera pro vera,*" the *expressed premise is false.* It will often be a mere matter of choice, however, whether to refer any individual fallacious argument to this head, or to that of the Ambiguous middle; yet still the distinguishing characteristic of this species of Fallacy seems to be that which we have specified.

2. *Petitio principio.* This Fallacy consists in *beg-*

ging the question, or taking for granted that which is to be proved. In this case the premise is either manifestly the same as the conclusion, although expressed in different words; or it is dependent on it for its own establishment. The philosopher's proof of his own existence is an example of this fallacy; "*Cogito, ergo sum.*" If a Professor of Divinity were to begin his course of Lectures with the doctrine of Divine Inspiration, he must necessarily fall into this fallacious mode of reasoning. For, however true this doctrine may be, and however convincing the arguments by which it can be established, still, in that stage of his inquiries, it cannot be proved to the conviction of his hearers, because he has not yet established other truths from which it must be deduced. Thus, whether he appeals to the promises of Christ to his Apostles, or to the express declarations of the Apostles themselves, he must take for granted that these promises and declarations were really made; that is, he must take for granted the *authenticity* of the writings in which these promises and declarations are contained. In like manner if a person should attempt to prove the existence of God, from the authority of Scripture, he would be guilty of this fallacy; because the Scriptures derive all their authority from the fact that they are the word of God,—which necessarily implies his existence.

Sometimes, however, it may be perfectly allowable, at the commencement of an argument, to take for granted a premise that is not more evident than the

conclusion, or that may be disputed by your adversary, provided you engage fairly to prove that premise afterwards. This, however, should be avoided as much as possible; for if we undertake to prove a proposition by the aid of another, which is itself hereafter to be proved, we are in great danger of falling into this erroneous mode of arguing. The proposition in question becomes a link in the chain, by which we establish that very proposition. The preferable way is first to prove the proposition that is needed for your argument, and then your course is straightforward and plain.

It is also perfectly allowable in an argument to begin by deducing your conclusion from a premise which may be exactly equivalent to the one which is to be proved; provided that no undue advantage be taken as to the matter in question. But the Sophist in doing this, will endeavour either to blink the question altogether, or, in a flourish of words, merely bring forward the same proposition, expressed in synonymous terms, which may have no resemblance in sound, or connection in etymology, and yet mean precisely the same thing. Thus, were the question in dispute, whether "Christian unity is alone preserved in the Roman Catholic Church;" and were a member of that communion to argue in the following manner, he would be guilty of this fallacy: "Examine the Catholic Church in every age, and in every country, and you will find it precisely the same. From His Holiness the Pope, down to the meanest member of

the true Church—from the days of the Apostle Peter, down to the present time, a sacred unity has ever been preserved." This is evidently a mere fallacy; instead of *proving* that the Catholic Church possesses and preserves this unity, the Sophist merely asserts and repeats what he ought to have proved. No language is so favourable for this kind of fallacy as the English tongue, from the numerous synonymous terms which it possesses, and which have in many cases no other point of agreement except their meaning.

There is another form of this Fallacy which is called *Reasoning in a Circle*, which must necessarily ever be unfair. This happens when the same propositions are made alternately premises and conclusion. The following argument will exemplify this fallacious mode of reasoning. Some have contended that the Scriptures are so ambiguous and obscure, that, when left to themselves, they are more likely to generate error than truth, to foment division rather than to produce unanimity and agreement. To this objection it has been eloquently and triumphantly replied; "What is the reason that the Scriptures may not be trusted alone? 'Why,' say our opponents, 'they are liable to be misinterpreted, and wrested to countenance the respective opinions and practices of different sects and parties.' Be it so: we admit this to be possible; but what remedy can be devised to obviate this evil? Is their use to be entirely proscribed? 'No,' say our opponents, 'but they must be invariably accompanied by another book, which may be considered in the

light of an authorized commentary.' But we would ask, again, Are we to judge of this commentary; or are we to receive it simply on the ground of authority, and upon the principle of implicit faith; or is any exercise of private judgment permitted to us? If it be replied that it is not, this is nothing less than open and barefaced popery. If the judgment is to be exerted at all, and every thing is not to be taken on trust, their commentary must be judged of by some criterion, and what can that be but the Scriptures? The Scriptures must then, after all, be appealed to before it is possible to determine on the correctness of the commentary; and thus we are led back to the precise point from which we set out, that is, the examination of the Scriptures. According to the views of our opponents, we are either to admit the principle of implicit faith to its utmost extent, which is open and avowed popery; or we are first to interpret the Scriptures by the commentary, and then judge of the commentary by the Scriptures. This is the circle, out of which it is impossible for our opponents to escape, and they may be lashed round it to all eternity!"

This fallacy evidently consists in the undue assumption of a premise equivalent to the conclusion, or necessarily dependent upon it. It is, therefore, very similar to the preceding; and the only way in which it can be detected, is, to observe narrowly the *Premises* which the Sophist may use; to strip them of their disguise; to point out the sameness of that

which he assumes with that which he establishes; and to require proof for what has been unduly taken for granted.

3. *Ignoratio elenchi.* This is the Fallacy of an Irrelevant Conclusion; and it takes place when the proposition which you prove is not the *contradictory* of your opponent's assertion. Thus, if a person were convicted of a crime in court, and his advocate were to attempt to disprove the charge, by proving that the prisoner had been greatly injured—that he was a person of excellent character—and that nothing of the kind had ever before been laid to his charge, he would be guilty of this fallacy; for none of these points were the matter under examination, and they might be all true, while his guilt remained nevertheless.

It often happens that this fallacy turns on some *ambiguity* in the proposition to be established. The Sophist sees that he cannot prove the matter in question in the sense in which it ought fairly to be understood; he therefore dexterously changes the meaning of the sentence, and, by establishing the proposition in its altered form, imposes on the unwary. Thus, if a person should attempt to prove that the inhabitants of a civilized country *were not free*, and in proof of this should prove that they *must be subject to the laws*, he would be guilty of this fallacy; because the truth of this conclusion does not at all invalidate the former statement, unless it be viewed in an unusual sense, and not in that sense in which it would generally be understood.

This fallacy is most frequently resorted to in cases of protracted dispute. When the Sophist finds that he cannot maintain his point, he shifts the ground of argument to some other view of the subject which he can more easily defend. Sometimes he may substitute a *particular* for a *universal* term; or he may prove something to be *possible*, when it ought to have been proved *probable;* or *probable*, when it ought to have been proved *necessary:* or he may prove it to be *not necessary* when it should have been proved *not probable;* or *improbable*, when he should have shewn that it was *impossible*. When he has proved this point, which, through his dexterous management may not be perceived to be at all different from the one in dispute, he may exult over his adversary as having gained the victory, while he has only been imposing on him with the fallacy we are now considering.

Sometimes, too, this fallacy consists in proving or disproving only *a part* of that which is required, and then drawing a conclusion as if the whole had been taken into consideration. Nothing affords a better example of this fallacious mode of reasoning than the present system of reviewing works as they issue from the press. Almost every Review abounds with this fallacy, whether the Review be favourable or unfavourable. In the one instance the objectionable parts of the work are overlooked, and the parts that are not so liable to objection are brought forward and dwelt upon; and in the other case, the excellencies of the work are kept out of sight, and those parts that are

most objectionable, or most easily refuted, are made the subject of animadversion; and then a conclusion is drawn, which may be correct enough in so far as those parts of the works are considered to which the Reviewer particularly turns the attention of his readers, but which is quite unjustifiable when the works are considered as a whole.

It is therefore considered a maxim, that we never should advance more in argumentation than can be *well* established; for in this way we give our adversary an advantage over us. The truth of a proposition is not to be determined by the *number* of arguments that can be brought forward in its favour, but by the soundness and conclusiveness of these arguments, whether they be many or few. If any fallacy is admitted, either through inattention, or by design, it will in the end do more harm than good. However specious these fallacious arguments may be in our own eyes, or in the estimation of our own party, when closely examined by our adversary, they can scarcely escape. Hence the injury done to a cause by a weak advocate: the cause itself will appear to be overthrown, when his futile arguments have been exposed and answered. In controversy, then, we ought to state what is true, rather than attempt to bring forward *all* that can, with any degree of plausibility, be said on the subject. If there are objections to what we advance, and we are able to answer them satisfactorily, let them be stated *in their full force*, since it is better they should be fairly stated by ourselves, than by an uncandid opponent;

if we perceive that they are *unanswerable*, let us honestly yield the point, as it will always be found ultimately the wisest and safest plan to abandon every argument inconsistent with truth. Were we therefore to place ourselves in the room of our opponent, and examine our arguments as he might be supposed to do, we should prevent him from gaining the advantage which he is likely to derive from weak and easily refuted arguments.

This fallacy is sometimes practised, also, by shewing that there are *objections* which can be brought forward against the point in dispute; and thence inferring that it ought not to be received. If any person can indeed shew that the objections *against* it, are more numerous and strong than the arguments that can be brought forward in favour of it, the argument may be considered valid; but the fallacy to which we now refer, is that of rejecting any proposition or theory, merely because it is not *free* from objections. This is the fallacy that is most commonly brought forward by those who attempt to impugn the divine origin of the Christian Religion; and respecting which the young ought especially to be put on their guard. It has been most ably illustrated and refuted in the following manner. "This is, as has been said, the principal engine employed by the adversaries of our Faith: they find numerous 'objections' against various parts of Scripture, to some of which no satisfactory answer can be given; and the incautious hearer is apt, while his attention is fixed on these, to forget that there are infinitely more,

and stronger objections against the supposition that the Christian Religion is of *human* origin; and that where we cannot answer all objections, we are bound in reason and in candour to adopt the hypothesis that labours under the least. That the case is as I have stated, I am authorized to assume, from this circumstance; that *no complete and consistent account has ever been given of the manner in which the Christian Religion, supposing it a human contrivance, could have arisen and prevailed* as it did. And yet this may obviously be demanded, with the utmost fairness, of those who deny its divine origin. The Religion exists: that is the phenomenon; those who will not allow it to have come from God, are bound to solve the phenomenon on some other hypothesis less open to objections: they are not indeed called on to prove that it *actually did* arise in this or that way; but to suggest (consistently with acknowledged facts) some probable way in which it *may* have arisen, reconcileable with all the circumstances of the case. That infidels have never done this, though they have had near 2000 years to try, amounts to a confession that no such hypothesis can be devised, which will not be open to greater objections than lie against Christianity."

In order that we may escape being imposed on by the fallacy of objections, we should remember that real and unanswerable arguments may be urged against a proposition that is nevertheless true, and which can be satisfactorily established by a preponderance of

probability. In what is called moral or probable reasoning there may be sound and valid objections on both sides. "There are objections against a *plenum*, and objections against a *vacuum;* but one of them must be true." The real question in such cases is, which of two alternates is the more probable, or on which side the evidence preponerates. Instead therefore of attempting to answer every objection, which the Sophist may bring forward merely to draw off attention from the more weighty arguments which you have advanced, the objector should be called on to frame an hypothesis that may be encompassed with fewer difficulties.

Sometimes, also, when irrefragable arguments have been advanced against something which is tacitly admitted to be indefensible, a sophistical refutation may be attempted by bringing forward something that is worse, taking it for granted that this is the only alternative. Thus, if objections are advanced against the Establishment Church, they may be answered by pointing out the evils of Dissent. If a person is blamed for being a spendthrift, he may dilate on the greater enormity of being a miser—as if there were any necessity for his being either. In all these cases the fallacy lies in establishing a conclusion which is irrelevant to the subject.

In order to detect and refute this Fallacy, in all the various forms which it assumes, we should particularly keep the attention fixed on the *Conclusion* that is to be established. The Sophist will generally avoid,

if possible, stating at the outset the proposition which he ought to prove. He will rather begin with the premises, and introduce as long a chain of argument as he possibly can before he comes to the conclusion; and, in order that he may the better draw the mind of his opponent from the precise point at issue, he will try if possible to suppress it altogether, and conclude the argument by merely stating that "that which was to be proved" has been established. In this way the inattentive are often deceived. If, however, we keep the precise point in dispute clear before the mind, and neither lose sight of it ourselves, nor suffer our adversary either to wander from it, or substitute any thing in its place, we shall generally escape the snare.

We have thus gone through the three divisions of Logic, and unfolded the principles and laws both of sound and of sophistical Reasoning. It will be necessary, however, before we close this brief treatise, to subjoin some general remarks on the application of the Science to practical purposes.

ELEMENTS OF LOGIC.

ON

THE APPLICATION OF LOGIC.

In the preceding Compendium the rules of Logic, in their bare elementary form, have been explained and illustrated. Although brevity has been particularly studied, it is hoped that the leading principles of the Science have been developed, and that nothing really essential to the subject has been overlooked. Little remains to be said which is not *implied* in the rules and principles already laid down. But the application of these principles to ordinary practice, if not distinctly pointed out, is liable to be misapprehended. On this part of the subject as many mistakes have prevailed, as respecting the nature of the Science itself. As therefore, it never was intended that the syllogism, expressed in full length, should be introduced into ordinary practice; and as some writers have affirmed that the rules laid down for distinguishing the conclusive from the inconclusive forms of argument, or the

true Syllogism from the various kinds of Sophisms, are at once cumbrous to the memory, and unnecessary in practice; and as others have maintained that the Inductive philosophy, or some kind of *rational* Logic, should be introduced, in the room of the Syllogism; it is thought necessary to subjoin a few supplementary observations on the application of the Logical system. We shall thus have an opportunity of exposing some of the incorrect notions that still prevail respecting this Science, and of embodying several particulars which, although of great importance in reference to the application of the system, could not with propriety be introduced while the mere theory was under consideration. We shall, therefore, endeavour to define the legitimate province of Logic—notice the various forms which Reasoning, though strictly syllogistic in its nature, assumes in popular use—the evidence on which the validity of these arguments rests—the obstacles which lie in the way of conviction and belief—and the connection which this Science has with rhetorical studies. Whether these topics can justly be regarded as a *part of Logic* may be questioned. There can be no doubt, however, but that they are important in themselves; and as they are intimately connected with the *application* of Logic, they may be very properly subjoined to the precepts of that Science.

CHAP. I.

OF THE PROVINCE OF LOGIC.

Much of the ridicule that has been so unjustly heaped upon this Science, has arisen from the mistakes that are prevalent respecting its legitimate object. It is customary to represent the syllogistic art, with its figures and moods, as serving merely to display the ingenuity of the inventor; and to furnish the student with the means of making an artificial and ostentatious parade of learning, which has the appearance of great profundity, but which is in reality destitute of all practical value. It has often been urged that syllogistic reasoning is altogether ineffectual as an instrument for discovering new facts in science, or for the acquisition of general knowledge. Hence some writers are very fond of bringing forward the Inductive philosophy in contrast with the Aristotelian Logic; and dilate on the advantages to be derived from substituting Induction for the "Logic of the Schools."

There is an evident unfairness in this mode of arguing. It is taking for granted that Induction and the Syllogism are *two distinct methods of reasoning*, which may be justly contrasted with each other; whereas this is by no means the case. It has been expressly laid down in the preceding treatise that the *Reasoning process*, in all cases, and on all subjects, is one and the same; and that the syllogism is *the* form in which all correct reasoning may be clearly exhibited,

and by which its validity may he ascertained. If, then, Induction be a method of reasoning distinct from the Syllogism, and which can fairly be brought into contrast with it, the foundation of the Syllogistic theory is shaken, and the whole venerable edifice must totter and fall. But we are not afraid of this overthrow. This argument so frequently, and, apparently, so triumphantly brought forward, is founded in mistaken views both of the Aristotelian and the Baconian philosophy.

When the illustrious Bacon arose to emancipate the world of science and letters from the thraldom of the Schools, he saw that Induction was the natural, and indeed *the only* way of discovering new truths, and collecting facts, by means of which the sciences might be cultivated and improved. He therefore brought back Philosophy to the path of nature and of common sense, and became the Father of that Experimental Philosophy, which is unfolded with so masterly a pen in his immortal writings. That the system which he introduced is, in many respects, superior in value and practical importance to the Aristotelian system, we apprehend there are few at the present day who would venture to deny. Still, as they both, in so far as they really differ, occupy a province perfectly distinct from each other, we hold it unfair that they should thus be contrasted, or that the one should be exalted to the disparagement of the other.

In order that this may appear, it is necessary that we glance for a moment at the Inductive philosophy.

In his Novum Organon Lord Bacon first shews that the Syllogism is of no use in ascertaining new truths; he next classifies and sets in a clear light the sources of error which impede us in reasoning; and lastly he unfolds the right mode in which we should seek after truth, and study nature. This method of philosophizing consists in investigating nature by observation and experiment, and ascending from a clear and distinct knowledge of facts and particulars, to those general laws or principles on which they depend. The name, *Induction* has been given to it, because, by this means, instances are *brought in*, one after another, to bear on the point in question, till a sufficient number has been collected to establish it into a general law; and when the conditions which are necessary to make the induction worthy of credit have been fulfilled, the mind is induced to believe the result.

In this method of searching after truth there is nothing that can properly be called new. It is thus that children, and savages, and men in general collect their information. They observe, and make experiments; and from the collation of facts thus ascertained draw their inferences. But Lord Bacon resolved this universal practice into its principles; and recommended it to the learned who had been led astray for ages by their erroneous or abused systems. In many cases a complete induction cannot be obtained; hence this mode of investigating admits of degrees of conviction, from a mere probability to absolute certainty. When our observation extends to a considerable number of par-

ticulars, and no exception takes place, this is considered sufficient to justify belief. But no rule can be laid down to fix the number of instances that may in every case be fairly considered sufficient to establish any matter of inquiry. This must depend, in a great measure, on the nature of the subject; on the manner in which the investigation has been carried on; on the skill, information, and acuteness of the observer; and on a variety of other circumstances which the peculiarities of the case can alone suggest. But the following rules were deemed essential, and were laid down as scrupulously to be observed in all inductive investigations: we must observe with attention and constancy—compare with circumspection and caution—discriminate with acuteness and accuracy—distribute with exactness and regularity—and apply principles already ascertained to the discovery of new truths. This is the method of searching after truth which has been called the Baconian or Inductive philosophy; and the superiority of this branch of philosophy, and the advantage of substituting it in the room of the Aristotelian Logic, is a subject which is, almost in every instance immediately brought forward, whenever any reference is made to the Syllogistic theory.

The proposition thus advanced, as we formerly remarked, is founded in mistake. It confounds the two perfectly distinct operations that take place in the Baconian method of philosophizing; and derives all its apparent force as an argument merely from the ambiguity of a term. From the brief outline of the

Inductive philosophy given above, it will be seen that one process which takes place in Induction, is that of *Investigation*, by which, through observation and experiments, we obtain *new facts;* another process is that of *Inference*, by which we *draw conclusions* from the facts which we have, by the other process, already acquired. Now, although these two processes are perfectly distinct, the name *Induction* is sometimes applied to the one, and sometimes to the other; and it is from the ambiguity which has thus arisen that Induction has been so generally considered worthy to rival and supplant the Syllogism.

When viewed as a *process of investigation*, by which we discover new truths, and acquire general knowledge, Induction certainly appears superior to the Syllogism. But, then, in this case, it is not a *process of reasoning*, but a process of *inquiry;* and in this sense to contrast it with the Syllogism is evidently unfair. It is by investigation that the *premises* of an argument are obtained; but this process lies beyond the legitimate province of Logic, which is employed exclusively with the *reasoning process*, or in drawing conclusions from premises of which we are already in possession. This latter process must, therefore, ever remain a perfectly distinct operation from the collecting of facts, or the laying down of premises. They may be both valuable; and may very properly be studied as mutual aids to each other; but to set up the one to the disparagement of the other is altogether unfair, since it is in fact condemning one department

of science because it does not accomplish the work of another. They have each their separate duties to perform, which the one cannot discharge for the other; and as they are not rival systems, they ought not to be set in competition.

But if we look at the other process which takes place in Induction, that *of deducing inferences* from the facts already obtained by observation and experiment, we shall find that this is a *process of reasoning*, and that, like all other arguments, it is capable of being syllogistically stated. In every case in which we deduce an inference respecting something unknown, from our certain knowledge obtained by observation or experiment, we are employing a syllogism in *Barbara*, with the major premise suppressed. Take, for example, one of Lord Bacon's instances; "The approach of a hot body increases heat according to the degree of nearness; and the case is the same in light, for the nearer an object is placed to the light the more visible it becomes." In this case it had been ascertained, in a number of instances, that the nearer a hot body approached, the greater was the degree of heat; it is therefore inferred that whatever belongs to the particular instances that had been examined, belongs to the whole class to which these instances are referred; and hence the conclusion is drawn that "the approach of a hot body in every instance increases heat according to the degree of nearness." The argument may be stated syllogistically, thus:

Bar- "Whatever belongs to these particular instances, belongs to all that class in which they are included;

ba- In all these instances the nearer the approach of a hot body, the greater the degree of heat; therefore,

ra. In all instances the approach of a hot body increases heat according to the degree of nearness."

The same reasoning process takes place when Lord Verulam infers in the above example that "the nearer an object is placed to the light the more visible it becomes." So is it in every instance in which we deduce, from our observation of certain known cases, an inference respecting some thing that is not known. Thus, to take another instance from the Inductive philosophy: "This, and that, and the other flame—except the flame of gun-powder and the like, where compression and confinement increase its force—prove strong, vigorous, and generative, only when they find some cavity wherein to move and play and exert themselves; therefore, so do all flames—except the flame of gun-powder, and the like."

Thus it appears that Induction, *in so far as it is an argument*, may be, like all other arguments, stated Syllogistically. Whether the induction has been sufficiently ample, and sufficiently accurate, and how far the instances examined may correspond with the class to which they are referred, must depend on the judgment, and acuteness, and diligence of the person who

ascertains the facts, and lays down the premises; but this all belongs to the process of *investigation*, which, it should be remembered, lies beyond the proper province of Logic. Whether the premises are true or false, the rules of Logic cannot of themselves ascertain. This must be provided for by a competent knowledge of the nature of the subject respecting which the reasoning is taking place. But if the premises are granted, which in every argument must be the case, or we never could advance a single step in any form of reasoning, then Logic will enable us to ascertain whether or not the conclusion *follows fairly* from the premises laid down. If the Inductive process has been without fault, Logic will ascertain whether or not the *argument* founded upon it be sound or fallacious. It is therefore altogether unfair to represent Induction as a method of reasoning superior to the Syllogism, since, in so far as it is argument at all, although expressed in a popular form, it perfectly coincides with it, and depends entirely on the *one principle* which Logic unfolds, and on which all correct reasoning must be founded.

Hence we may see how unmerited the obloquy is which has been poured on this study. The legitimate province of Logic is reasoning, not discovery. It never was intended as an instrument for the discovery of what may be strictly called new truths; but merely to unfold the general principle on which correct reasoning is conducted, and to furnish a standard by which the validity of any argument may be ascertained. It has

indeed been contended that every syllogism must be futile and worthless, because the premises virtually assert the conclusion; and that there is always some radical defect in a syllogism, which is not justly chargeable with involving a *petitio principii*. But this objection is applicable necessarily to the reasoning process itself, and consequently to *all kinds of arguments*. Whatever form reasoning may assume, the inference that is drawn, if it be at all warranted, *must* be contained in the principle from which it is deduced. The premises in every instance contain a general truth which is evolved by the reasoning process, and asserted in the conclusion; hence the conclusion never can contain more than is virtually contained in the premises. Every argument must proceed on some *data;* and the object of all argumentation is to expand and unfold what is thus granted, so as to bring a person to perceive and acknowledge what he has already admitted. This is the principle on which *all* correct reasoning must necessarily proceed; and it is the object of the Aristotelian Logic to unfold the *general law* to which every individual argument may be referred, and by which it may be ascertained whether it be conclusive or not.

It is evident, then, that the province of Logic is not to discover truths absolutely unknown, or that are not *implied* in anything with which we are previously acquainted. All these *matters of fact* must be obtained through *information;* an acquaintance with them must be gained by observation, or experiment,

or testimony, or any of those means whereby we acquire general knowledge: but no process of mere reasoning will ever put us in possession of them. No mere process of argumentation could ever inform a person, that the earth is nearly fifty times the magnitude of the moon; or that Jupiter has four satellites, and that Saturn has a luminous ring. These are facts which must be learned not *without* reasoning, because this mental process enters largely into all the methods by which information is obtained; but argumentation *alone* is not sufficient, since without observation, or testimony, we have no premises from which such conclusions can be drawn. The discovery of all such *matters of fact* lies without the province of the science of Logic; but surely it is not any just cause of reproach that it cannot accomplish what it never was intended to do.

There are some truths, however, which may be elicited by reasoning, and which have been justly called Logical Discoveries. These are of course implied in what we already know; but we do not perceive or admit them, till they are brought out by argumentation. This process of evolving truths from others already admitted, takes place in every act of reasoning; and it is the province of Logic to analyse this process, to point out the principle on which it rests, and the laws by which it is regulated; and to enable us to ascertain, as far as the mere process of reasoning is concerned, whether the conclusion is or is not a legitimate deduction. In this way vague and inconclusive arguments

may be detected, which would probably otherwise escape, especially when involved in a multiplicity of terms. To represent such an instrument as destitute of all utility, or to speak of it as merely the science of *logomachy*, betrays an utter ignorance of its nature and object. It is reported of Lord Mansfield that, on one occasion, when pleading at the bar, he was confounded and perplexed with an argument, which he was convinced was false, but of which he could not detect the sophistry; and that, upon going home, and throwing the various propositions of which it consisted into the syllogistic form, he instantly discovered the fallacy. The Aristotelian Logic is therefore by no means so worthless, or so injurious, as has been represented. Had it not been greatly abused, both by its friends and its foes, a system formed on so just an analysis of the reasoning process, and calculated, when kept within its own limits, and employed on its own proper duties, to be of such use, had never been stigmatized and neglected as has unhappily and unjustly been the case.

CHAP. II.

OF THE POPULAR FORMS OF ARGUMENTS.

Much misapprehension relative to the practical utility of Logic has sprang from the mistake into which many justly celebrated writers have fallen, that

Aristotle meant the syllogistic form of reasoning, expressed in regular figure and mood, to supersede the various forms of reasoning in common use. This error lies at the foundation of all Locke's objections to the Syllogism. It is implied in what Campbell, in his Philosophy of Rhetoric, brings forward, when he affirms, "that this form of reasoning is a very incommodious one, and has many disadvantages, but not one advantage of that commonly practised, will be manifest to every one who makes the experiment. It is at once more indirect, more tedious, and more obscure." And Lord Kames charges Aristotle with inconsistency, because "in his Treatise of Ethics, Politics, &c. he argues like a rational creature, and never attempts to bring his own system into practice."

A mistake so palpable we should scarcely have thought worthy to be mentioned, had it not been advanced by these distinguished authors, who have thus given it a prevalence and importance which it could not otherwise have obtained. It never was intended that this mode of unfolding arguments should be introduced into general practice, or that all the popular, abbreviated forms of stating an argument should be abandoned, in order that the Syllogism, stated at full length, might be universally employed. This would be as absurd as for a Grammarian to *parse* every sentence he reads. Who ever dreamt that this was the object which Grammar was intended to accomplish? And why should a supposition as absurd have been entertained respecting the Science now under considera-

tion? On this subject it has been well remarked, that "Logic, which is, as it were, the Grammar of Reasoning, does not bring forward the regular Syllogism as a distinct mode of argumentation, designed to be substituted for any other mode; but as the form to which *all* correct reasoning may be ultimately reduced; and which, consequently, serves the purpose (when we are employing Logic as an *art*) of a test to try the validity of any argument; in the same manner as by chemical analysis we develope and submit to a distinct examination the elements of which any compound body is composed, and are thus enabled to detect any latent sophistication and impurity."

The different forms which reasoning assumes in common practice have been variously classified by Logical and Rhetorical writers. They have divided arguments into regular and irregular; direct and indirect; *a priori* and *a posteriori;* hypothetic and inductive; synthetic and analytic; moral and demonstrative; arguments from example, testimony, analogy; and various other subdivisions which it is not necessary even to specify. Many of these divisions, however, are not divisions of reasoning at all: and many of them are evidently made on very different principles; sometimes according to the form which the arguments assume, sometimes according to their subject matter, and sometimes according to the purpose for which they are employed; hence they run into each other; and many of the arguments thus specified may be placed in one class or another, just according to the view that is

taken of them at the moment. To invent and arrange arguments is properly the business of Rhetoric; it may be proper, however, to state some of the *forms* which they assume in common practice; as an acquaintance with them is necessary in order to our being able to apply our scientific knowledge to the best advantage. It will be a useful exercise for the student to take examples of these different forms of argument, and reduce them to the regular syllogistic form, which it will be found, in so far as they are correct arguments, they can all be made to assume.

[redacted] and *irregular* forms of arguments developed in the preceding pages. The same may be said also respecting the *direct* mode of arguing, which is merely the simple and obvious method of drawing a conclusion *ostensively*, from admitted premises. The *indirect* method of reasoning is that of drawing a conclusion *indirectly*, by means of some other conclusion which must be admitted as the alternative, if the proper conclusion be denied. Of the *indirect* arguments several kinds are enumerated by Logicians; as the *argumentum ad hominem*, or an appeal to the principles of an opponent; *argumentum ex concesso*, or a proof derived from some truth already admitted; *argumentum a fortiori*, or the proof of a conclusion deduced from that of a less probable supposition that depends upon it; *argumentum ad judicium*, or an appeal to the common sense of mankind; *argumentum ad verecundiam*, or an appeal to our reverence for some respected authority; *argu-*

mentum ad populum, or an appeal to the passions and prejudices of the multitude; *argumentum ad ignorantiam*, or an argument founded on the ignorance of an adversary; the *reductio ad absurdum*, which is the proof of a conclusion derived from the absurdity of a contrary supposition: and to these might be added various forms of *demonstrations* which may be found in the writings of Geometricians. These arguments are called *indirect*, because the conclusion that is established is not the absolute and general one in question, but some other relative and particular conclusion, which the person is bound to [redacted] to maintain his consistency. The *reductio ad absurdum* is the form of argument which more particularly comes under this denomination. The *argumentum ad ignorantiam* is evidently nothing more or less than some Fallacy employed to deceive. Indeed they will all be found, in so far as they are correct arguments, capable of being reduced to the syllogistic form; and in so far as they are fallacious, their falsity may be detected and exposed, as was pointed out in the preceding pages when treating of Fallacies.

In reasoning *a priori* we use arguments to prove a *fact* from a given *law*, or an *effect* from an alleged *cause*. In this way the immortality of the soul was attempted to be proved, in a preceding part of this work, when treating of the *Sorites*. In reasoning *a posteriori* we endeavour to prove the existence of an alleged *cause* by reasoning from the *effects* which have been produced. Thus we may argue from the phenomena of nature,

and the proofs of wisdom and design in the works of creation, that they must have been produced by an intelligent Creator. In each of these modes the reasoning process is the same; since it is merely the deducing a conclusion from given premises. The difference lies in the nature of the premises, not in the argumentation. And when treating of the abbreviated form which this species of argument generally assumes, we shewed that it was entirely dependent on the laws of the Syllogism.

The various canons and properties of *hypothetic* reasoning have been already fully developed; and the *inductive* process, in so far as reasoning is concerned, has also been considered. The *synthetic* and *analytic* processes, which are often brought forward as distinct kinds of reasoning, are not properly different forms of arguments, but different methods of investigation. In so far as reasoning enters into these processes, they differ nothing from what has been already developed. The only difference that can be pointed out between them lies merely in the manner in which the process of investigation is carried on. To dwell on them is therefore quite unnecessary.

To Moral and Demonstrative Reasoning we shall have occasion to refer more particularly hereafter; we only notice them at present to shew that they are capable of assuming the syllogistic form. *Moral* reasoning is employed in the discovery of contingent truths, and consists in bringing forward a number of arguments to shew that the matter respecting which the ar-

gumentation is carried on, is supported with sufficient evidence to claim our belief, though we cannot shew its *absolute certainty*. Thus when we say, "The man who is industrious and sober will acquire riches," the argument implied in this assertion is called *moral*, or is founded on probability; because we know that industry generally meets with encouragement, and enables a man to acquire wealth; that sobriety prevents him from needlessly spending it; and that the accumulated earnings of many years will at last increase to a considerable sum of money. But this does not amount to an absolute certainty; for though industrious, a man may not be able to get sufficient employment, or employment of such a kind as will enable him to acquire riches; or if they are acquired, he may be deprived of them by ten thousand accidents, which he can neither see nor prevent. This mode of arguing, however, in so far as the process of reasoning is concerned, was fully explained when treating of hypothetical syllogisms. *Demonstrative* reasoning is used in proving *necessary* truths. This form of reasoning produces belief immediately, as soon as the terms are understood in which it is expressed. It differs from probable or moral reasoning, since there is always a possibility of the latter being fallacious, which cannot be the case in the former; since a demonstration proved by one argument, is as firmly believed as if it were proved by twenty. In probable reasoning, however, the strength of evidence very often increases with the number of the arguments. The proper province of

demonstrative reasoning is the mathematics; and that it is capable of being moulded into the syllogistic form, admits of no question. Even the enemies of the logical system have been obliged to admit this. Dr. Campbell, when endeavouring to reprobate Logic as capable only of sheltering fallacies, under the awkward verbosity of this artificial system, acknowledges what we now have advanced. "I am satisfied," he says, "that mathematical demonstration is capable of being moulded into the syllogistic form, having made the trial with success on some propositions."

Such are the various forms of argument which are employed in common practice. They are all useful and necessary, and the person who would propose to abandon them, and introduce on all occasions the Syllogism, expressed in due form, in mood and figure, would be a fit object for pity or ridicule. This is not the intention of Logic. The examples given in the developement of the syllogistic system are necessarily made to assume the form of the regular syllogism, since it is the object of the science to shew that all reasoning may be reduced to that form, and depends for its validity on the laws there laid down. From this, perhaps, the absurd idea may have arisen, that this mode of stating an argument was intended to supplant all others. Nothing could be more unfounded. These different forms may all be retained, and employed as may best suit the object of the reasoner, or the nature of his subject. All that Logic proposes to effect is, to develope the principles on

which the reasoning in all these cases depends,—to explain its nature and laws,—and to aid our practical ability in conducting an argument, by the impartation of scientific knowledge.

As, however, it is only to arguments when exhibited in their bare elementary form that the rules of Logic apply, it will be necessary, when these arguments are found in a popular form, to reduce them to the form of the syllogism, before the test of logical principles can be with advantage applied to them. The student therefore would do well to accustom himself to this method of analyzing and reducing popular arguments. Enough has already been laid down in what has preceded, to aid him in so doing, both by precept and example. It is not necessary, however, that he should confine himself, in thus applying the rules of Logic, to mere isolated arguments. He may examine paragraphs, or sections, or even whole books of an argumentative character, and develope and try the whole chain of reasoning, to whatever length it may be drawn out. In this case, in order to gain his object effectually, he must begin with the last point proved, whether it be formally enunciated or not; and tracing the reasoning backward, he must first ascertain on what this assertion is founded. The assertion will then be the conclusion, and the ground on which it rests, will be the premises; the whole may then be expressed in the syllogistic form, and be tried by the rules of Logic. The premises must then be taken separately; and with each of them the same course must be pur-

sued, as was carried on with the former conclusion. The proof on which they rest must be carefully examined and tried; and the process be repeated till the whole train of argument, to whatever length it may extend, has been examined and decided on. This is all that Logic pretends or purposes to do; and to represent it as either able or intended to do more, is to abuse the Science. As this method of logical analysis is so intimately connected with the application of Logic to practice, we shall give in an Appendix a more lengthened detail and example of the right mode of conducting it.

CHAP. III.

OF THE NATURE AND LAWS OF EVIDENCE.

All Reasoning supposes that there are certain principles in which mankind acquiesce, and which they admit as sufficient to establish, beyond all reasonable doubt, the opinions to which they yield their assent. Were this not the case we should have no *data* on which to proceed in argumentation, and no criterion to which we could appeal in any case that was doubtful to ourselves, or disputed by others. The attempt to convince another, by any process of reasoning, would therefore be an endless and a fruitless labour; because, whatever might be advanced in favour of any disputed point, might itself be questioned as much as the

point which it was intended to establish; and thus we should go on for ever, without being able to appeal to any principle that was admitted as requiring no proof, or that was deemed sufficient to command assent, or produce conviction. We must have some *ground* or *reason* for what we believe; our opinions must be founded on something that is more evident than they are themselves; and this ground on which we rest our opinions is called Evidence. As it is necessary in all cases that we judge fairly according to the nature of the evidence before us, we never can be good reasoners without some knowledge of the principles on which the truth of an opinion or a proposition ought to be decided on. In order, then, that Logic may be applied with propriety and effect to practical purposes, it is necessary that we be acquainted in some degree with the nature, varieties, and laws of evidence.

The methods whereby we gain an acquaintance with the different departments of knowledge are very various; and the evidence that confirms these facts has also been arranged into numerous different classes by those who have written on the subject. Buffier, Beattie, Reid, Campbell, Stewart, and many other eminent authors, have discussed the doctrine of evidence with very great ability; and to their works we must refer those who wish to see this important branch of metaphysical and moral science fully discussed. A mere outline is all that can here be attempted consistently with the plan of this brief treatise. These writers have differed somewhat from each other in their clas-

sification and arrangement of the sources of evidence; but in the grand principles which are laid down and developed they have in a great measure agreed. The simplest classification is that founded on the manner in which our assent is commanded, or our judgments formed. In some cases we immediately yield our assent to a proposition as soon as the terms in which it is expressed are understood. In other cases, our decisions are formed in consequence of a process of thought consisting of different successive steps. This method of classification arranges all evidence into two great divisions, *Intuitive* and *Deductive*—the nature and properties of which we must shortly notice.

Under Intuitive Evidence has been ranked that which is derived from *mathematical and physical axioms*. Of this kind is the evidence attending propositions like these,—one and four make five—things equal to the same are equal to one another—a whole is greater than its parts—a body cannot be in two places at the same time; and in short all axioms in arithmetic and geometry. All such propositions have an original and intrinsic evidence, which makes them, as soon as the terms in which they are couched are understood, intuitively believed. If they are not thus admitted at once, no deduction of reason, nor process of argumentation, will ever make their truth more apparent, or give them any additional evidence. All axioms of this kind are founded on some certain first principles, which we are so formed as necessarily to admit as true and undeniable, as soon as they are presented to the mind.

To this head, also, is assigned the evidence derived from the *report of our senses*. It is in this way we obtain our knowledge of external objects, and the conviction that they really are what they appear to be. When we see a man, or touch a table, or taste a mango, we are irresistibly led to believe that these objects exist, and that they have size, shape, colour, and the various qualities which our senses inform us they possess. We have a perfect certainty of the reality of the sensations which we experience in these instances. Our senses furnish us with evidence of the real existence of any thing which thus comes within the sphere of our sensations; and to this evidence we are induced at once to give credit, without having recourse to any reasoning process to confirm its dictates. Sometimes, it is true, the apparent evidence of our senses is not correct, and not to be trusted. But in these cases the organs are not in a healthy state; or the objects are not conveniently situated; or the medium is not suitable, or in its proper state; and hence the evidence is vitiated. But even in these cases we yield an assent to what our senses appear to declare; and so certain is our belief in the testimony which they give, that, unless the testimony of one sense corrected the apparent evidence of another, we should often be led astray.

The evidence of *consciousness* belongs also to this class. By this means we have a perfect assurance of our own existence. We know that we exist, and that we are really the subjects of all that is passing

in our minds. We are convinced, by evidence the most irresistible, that we think, and reason, and remember, and feel, and perform all the functions of life. The evidence derived from consciousness is so undeniable, that it has never been questioned even by the most sceptical. This evidence is absolutely essential to us, since without it we never should be able to carry on the common business of life; and although the judgments thus formed cannot be moulded, as axioms are, into general positions, to which a chain of reasoning may be applied, yet, although they differ in nature, they are quite as conclusive and convincing as any axiom.

Another branch of intuitive evidence arises from what has been called *common sense.* This is a source of knowledge common to all mankind: it is possessed in different degrees by different persons, but none are totally destitute of it, except those who are not in the possession of their faculties. It is in this way we derive our conviction of the truth of propositions like these,—whatever had a beginning had a cause—when there is contrivance and skill perceived in an effect, there must have been an intelligent cause—the course of nature will be the same to-morrow as it has been to-day; all propositions of this kind, the constitution of our mind compels us to believe, without any external proof. The evidence of common sense, being a natural dictate of the mind, is also as firmly believed as any mathematical axiom.

The evidence of *memory* is another branch of in-

tuitive evidence. When events which have lately happened are recalled to the mind, we are so constituted as to give implicit confidence to what memory reports respecting them. We are absolutely certain that the events happened, and that that which is impressed on the mind respecting them is positively certain. Rememberance, it is true, is not always accompanied with this absolute conviction; since the facts which are recorded on memory are in many cases very soon partially effaced or obliterated; or, if they remain, from various causes, they may be confounded with other events, or perhaps with the mere figments of our imagination. But if we distinctly remember any past event, we are absolutely certain that it took place, and can no more doubt respecting it, than we can doubt the testimony of our senses. It is not possible to draw the line correctly between those impressions on the memory which command instant belief, and those others which are so imperfectly remembered as merely to justify supposition or opinion; nor is this at all necessary, since the mind itself will afford, in most cases, all that is needed to regulate our decisions and conduct. But whenever the truths which are called up in the mind are clearly and distinctly recognized, we implicitly rely on the evidence which memory thus affords. And experience will materially aid us in those cases in which we are doubtful whether what appears to us to be the intimations of memory are really so or not.

These are the principal classes into which *intuitive*

evidence has been divided. It includes every thing the evidence of which results from the mere simple contemplation of the object, and which requires no medium to confirm its truth, but the evidence which the object itself carries along with it. The classification adopted respecting the various kinds of evidence included under this head, is not perhaps perfect, or in every case uniform; as some writers prefer one division, others another; but the distinguishing characteristics by which it may be known are these; the belief attending it is instantaneous, irrisistible, and universal; wherever there is room for comparison, or any necessity for reasoning, this evidence is wanting. If then in any process of argumentation an appeal is made to the evidence thus obtained, the appeal is final. The decisions thus formed are first principles beyond which we cannot advance, and which never can be made more evident by any additional evidence or argumentation. The various attempts which learned men have made to prove that which evidently lies beyond their power to evince, have only exposed them and their efforts to ridicule. First principles are the *ne-plus-ultra* in reasoning. These we must admit as self-evident, without being able to assign any reason for believing them, except that we are so formed as necessarily to admit them. The man that denies them is irrational, and ought not to be argued with, but commiserated.

On the other hand Deductive Evidence is that to which we yield our assent, because we are satisfied

with the proof which has been brought forward to confirm it. This branch of evidence has been divided into two principal divisions—*demonstrative* and *moral*. The former rest either on axioms, that is, self-evident truths which we receive intuitively on their own naked authority, or on propositions which have already been proved. To this the name *scientific* has been given, because science is built on this kind of evidence. But moral evidence respects truths that are contingent, and is founded on what has been called moral axioms, or the principles we derive from consciousness, common sense, and experience. It proceeds on the presumption that those principles which guide us in life are to be depended upon. It, however, admits of degrees, and may be weakened or overthrown by contrary evidence. To this the name of *probable* has therefore been given. The nature of both these kinds of evidence, their properties, and varieties, must shortly be considered.

Demonstration has for its object abstract, independent truth. The propositions with which this kind of evidence is conversant have no respect to time or place; no dependance on any existing state of things, or matters of fact; their truth lies not in conformity to the nature of things, but in conformity to themselves, or to the hypotheses which have been formed respecting them. Hence their truth is necessary and eternal. They are not only true, but it is impossible they can be false. Every assertion opposite to truths of this kind is not only false, but absurd.

Thus the assertions,—the whole is greater than any of its parts—if equal things be taken from equals the remainders will be equal—all the angles of a triangle are equal to two right angles—circles are to each other as the squares of their diameters,—must ever remain immutable truths; and they would be so were there nothing in nature to which they as definitions could ever be applied. But were the opposite to be affirmed,—the whole is *not* greater than any of its parts—if equal things be taken from equals the remainders will be *un*equal—all the angles of a triangle are *not* equal to two right angels—circles are *not* to each other as the squares of their diameters,—these assertions would not only be false, but absurd, inconceivable, and self-contradictory. This does not hold, however, in moral evidence. It is conversant with *matters of fact*, that is, the various, changeable, contingent, though real connections that take place among things actually existing. These matters of fact can never be demonstrated mathematically; but they may be proved in such a manner as to leave no more doubt on the mind respecting them, than there is respecting a truth that has really been mathematically demonstrated. I have no more doubt that I was present in such and such a place, at such and such a time, than I have that 'the cube of two is the half of sixteen;' or that 'all the angles of a triangle are equal to two right angles.' But the *kind* of certainty I have of these different truths is very different; for mathematical propositions are not true in the same sense as

matters of fact. To deny truths founded on moral evidence implies no absurdity or contradiction. Were a person to say that I was *not* present in such and such a place, at such and such a time, though the assertion might be false, the contrary of it is neither absurd, inconceivable, nor self-contradictory; but it would be so were any person to deny the truth, or affirm the contrary, of the above mathematical propositions.

In demonstration the evidence is perfect, or it is no evidence at all. Eternal and necessary truth does not admit of degrees. But it is not so in moral evidence. This relates to actual truth, or matter of fact, in reference to which probability is often the highest point we can reach. It admits therefore of degrees, from mere probability, to absolute moral certainty. In almost every case in which moral evidence is employed there are contrary evidences to be balanced, and the evidence on the one side may weaken or overthrow the evidence on the other. But this cannot take place in demonstrative evidence. Here contraries can have no place. If a demonstration can be refuted it must be by another demonstration; and to suppose that this can happen, is to suppose that contraries can be demonstrated, or that the same proposition can be both true and false. Demonstrative evidence, then, is in many respects very superior to moral. It is simple, consecutive, and conclusive. But its sphere is limited; it is not therefore by any means so useful in the affairs of life, as the more complicated, disjointed, and

often doubtful evidence of a moral kind, which can be applied to almost every thing that comes within the compass of human knowledge, and particularly to every thing that comes home to our business and bosoms. Although, then, less dignified than demonstrative evidence, moral evidence is more useful, and therefore merits particular attention. It has been distributed into three classes, that of Experience, Analogy, and Testimony.

The evidence of *experience* results from our observation of the present, and our remembrance of the past. When we have observed a number of events of the same kind to happen uniformly in the same circumstances, we are induced to believe that these events will always happen in similar circumstances. This evidence is deductive, consequently it depends on the number of the antecedents and consequents. If the facts on which it is founded be sufficiently numerous, and are not confronted with any contrary experiences, the conclusion is morally certain, and we may be perfectly assured that the fact thus deduced is true. Thus we are perfectly assured that the sun will rise to morrow—that the seasons will succeed each other in their regular order—that fire will burn—iron sink—and deal float, because these conclusions are all built on a full and uniform experience. But when this full, uniform, and constant experience has not taken place, our judgments cannot amount to moral certainty, but only to some degree of probability. Thus, it is perhaps probable that, in the last week of April, a storm will

pass over Calcutta; because we know that storms frequently happen at that season in Bengal. That at some time or other, during that same month, it will rain in some specified part of Bengal is *more* probable; because this in almost every year is the case. Still it is not certain, because the experience is not uniform. That it will rain during the month of June in Bengal, may perhaps be pronounced certain, because this has been found almost without exception to be the case. If, then, constant experience has convinced us that certain events have, in certain circumstances, uniformly occurred, we are justified in expecting the same in like circumstances again. The uniformity of the laws of nature renders this sort of evidence sufficient to produce the most perfect assent. Experiment also may be brought in to confirm its testimony; because the more we become acquainted with elementary natures, the more we are convinced, by a general experience, that their operations are uniform and invariable. This species of evidence is of vast importance as it is the foundation and criterion of almost all moral reasoning.

Another branch of moral evidence is that derived from *analogy*, which is nothing more or less than a mere indirect experience, founded on some similitude existing between things that are compared together, and which we have ascertained by means of observation or experiment. We are thus induced to believe that similar causes will produce similar effects; and from our knowledge of certain properties in objects which we know, are led to infer that similar properties

exist in other objects which are unknown, or but imperfectly discovered. Thus we may conclude from analogy that the planets are inhabited; because we have every reason to believe that they are worlds like our own —enlightened by the same sun—subject to the same laws—undergoing similar revolutions—and enjoying the same vicissitudes of season; and as every part of nature, with which we are acquainted, teems with inhabitants, we have good grounds for supposing that the orbs which illuminate the vault of heaven are also inhabited. The evidence in this case, however, is much weaker than that of direct experience, because it is founded only on its resemblance to that which experience teaches us is really the case. It therefore amounts only to *conjecture*, while the other reaches to absolute certainty. The evidence of analogy rests entirely on the number and certainty of the degrees of resemblance, and hence it is weakened in proportion to the remoteness of the resemblance between the objects compared. When a subject admits of no other kind of proof, this species of evidence may be with propriety and advantage adopted. Its legitimate province, however, is rather to silence objections, than to establish truth; and with what effect it may be used for this purpose by a skilful hand, may be seen by consulting Butler's Analogy of Religion Natural and Revealed, in which the objections of sceptics against Christianity are so triumphantly refuted.

The third grand division of moral evidence is that of *testimony*. Testimony is a serious statement given

by another respecting something with which he is supposed to be acquainted. By this means we become informed respecting facts which lie not within the sphere of our own observation; and when the conditions are fulfilled which are necessary to make the deposition of others credible, we are led as firmly to believe this evidence, as we do the evidence of our own experience. The confidence we repose in this species of evidence, springs from the conviction we naturally have of human veracity, or of the veracity of the witness who, in any particular instance, bears testimony to a fact. It is not founded in our own individual experience, because the evidence thus afforded is often stronger than any we can attain by mere experience. It embraces the experience of others as well as of our own; and to it we are indebted for by far the greater portion of our real and most valuable knowledge. This testimony may be either oral or written. The former is generally employed respecting those objects which have come under the observation of the person himself; the latter is employed in recording events that are past. And although in some instances human testimony is weak, and little to be depended on, it may nevertheless reach to absolute certainty. It requires, however, to be properly guarded; and the various circumstances must be carefully observed which tend to corroborate or invalidate its evidence. The credit given to oral testimony depends very much on the character, condition, and circumstances of the witness: and the credit given to written testimony depends, among other things,

principally on the opportunity which the writer had of becoming sufficiently acquainted with what he relates. And when the testimony of any one is confirmed by a number of concurrent, independent, and creditable testimonies, the truth of the fact is established beyond all reasonable doubt.

In examining the validity of human testimony we should enquire whether the witness is, or is not, himself deceived. If he is competent properly to understand the subject respecting which he speaks—if he has seriously applied himself to its examination—if his mind be free from those passions and biases which might warp his judgment, then we may reasonably conclude that he is not imposed on himself, and therefore, that his testimony, so far, is worthy of credit. Another point to be ascertained is, whether or not the witness has any wish to deceive others. In order to ascertain this we must consider whether his general character is such as to warrant confidence—whether he is likely to have any private ends to serve, in this particular instance, which might induce him to practice deception—or whether his testimony is likely to turn to his own disadvantage, for men will seldom attempt to impose on others without having some intention of thereby bettering themselves. Hence a man's testimony may generally be depended on, if it is given at the risk, or actual loss, of any worldly advantage. Concurrent testimony, where there has been no previous concert, will here render most valuable assistance. If the witness be neither deceived himself, nor have

any intention of deceiving others, we must still farther enquire, whether he has clearly and correctly given his testimony, and whether we have rightly understood his meaning; because neither the one party nor the other may have properly attended to the terms employed, and thus, through mere inattention and carelessness, both may go astray. When, however, the witnesses are intellectually and morally competent to give evidence—when their number is sufficient—their testimony clearly expressed—and we have correctly apprehended the import of the testimony given, the evidence thus derived is as convincing as demonstration.

Such, then, is a brief outline of the various kinds of evidence, both intuitive and deductive, which may be employed in judging of the truth or falsity of propositions. By attending to these particulars we may be materially aided in the assumption of premises, or in acquiring the *matter* of which our reasoning must be composed. The observations which writers on this subject have laid down may be highly serviceable in reference to the application of Logic; but they are of course comparatively vague and general, and cannot be reduced to any strict theory, like that which the reasoning process has been made to assume. Much in this matter must of necessity be left to the natural good sense, shrewdness, and intelligence of the individual.

CHAP. IV.

OF THE CAUSES OF ERROR IN JUDGING AND REASONING.

It is of great moment, in all our investigations, not only that we be acquainted with the evidence according to which we ought to judge, but that we bring our mind to the examination of the subject in a fit and proper state. Numerous are the impediments which hinder us in our search after truth, and which often render it a most difficult matter to persuade or convince others. The natural perverseness and precipitancy of the human mind, and the numerous pre-conceived opinions, mis-conceptions, and prejudices, which have sprung up, and grown with our growth, and strengthened with our strength, present, in many cases, an almost insuperable barrier to conviction and belief. These blind the mind, and pervert the judgment, so that we are easily led to assent to propositions that are false, while we neither perceive the truth of those that are almost self-evident, nor assent to them when proved by incontestable evidence. A few observations, then, on the causes which lead to these most injurious consequences, may not be out of place, or destitute of utility.

An *error* is the assent of the mind given to a false proposition. It has its seat in the mind, not in the proposition; hence the cause of the error must be sought for, not in the erroneous statement, but in the

state of the mind by which it was laid open to deception and imposition.

Almost all the errors into which mankind fall may be traced either to the precipitancy with which their opinions are formed, or to the prejudices which they have entertained. Nothing seems to be more irksome to the human mind than a state of doubt and hesitation. It delights to bound from truth to truth, with a rapidity that might have been sustained without detriment, had it not fallen from its original dignity, and lost much of its primitive capability. But as our physical strength is impaired by disease, so are our mental energies by spiritual maladies; and therefore it is only by patient research, close attention, and slow degrees, that we can with any safety proceed in our acquisition of knowledge. This is a drudgery, however, to which many cannot submit; hence, through the influence, sometimes of bodily constitution, or mental sloth, or mere indifference, or impatience of restraint, or the sudden impulse of some passion or propensity, or the necessity of choosing speedily between conflicting opinions, they hurry over the subject with thoughtless inattention, and easily fall into errors, which a very little consideration would have enabled them to escape.

Prejudice, however, is the most fruitful source of error. By prejudice we understand a judgment prematurely formed, and assented to without sufficient examination or evidence. Now, although we may be prejudiced in favour of the truth, as well as against

it, yet, as truth requires no such auxiliary, and as error finds in it a most powerful ally, it would be well were all the prejudices that abound to be exposed and abandoned, and their places occupied by sound reason and solid proof. Philosophers have therefore attempted to classify and describe these diseases of the mind, and to point out their proper remedies. The divisions that have been adopted in so doing, are, of course, various; and perhaps it is not possible to devise any general heads under which the whole can be distinctly arranged. The division adopted by Lord Bacon is the best with which we are acquainted. He has denominated the various causes of error, the Idols of the understanding, and arranged them into four classes: *Idola tribus; Idola specus; Idola fori;* and *Idola theatri.* We shall briefly explain the several members of this division, and illustrate them with examples.

To every false notion of the mind, by which men may be drawn into error, Lord Bacon has given the name *idol.* By this figurative term he elegantly distinguishes false science from true. In true science truth is the only proper divinity, and to this the understanding, when free from prejudice, yields her enlightened homage. But erroneous notions are a species of idols which usurp the homage which the mind ought to render only to truth. They are therefore stigmatized as false deities which ought to be abandoned and destroyed.

Of these causes of error the first class includes the

Idola Tribus, or the Idols of the Tribe. These have their foundation in human nature itself, without having regard to any modifying circumstances, and are therefore incident to the whole tribe or race of man. The principles that thus lead us astray are highly useful and necessary when properly regulated or applied; the danger springs entirely from their excess, or defect, or wrong direction. This head Lord Bacon illustrates in a very admirable manner, by shewing how apt we are to reason on a mere assumption; to regard our preconceived opinions; to follow our imagination; to expect too much from our limited capacities; to trust too implicitly to the testimony of the senses; and to cherish an undue fondness for generalization.

In illustration of these particulars Lord Bacon observes that the mind has naturally this property, that it supposes a greater order and uniformity in things than is really the case. Though many things in nature are unique, and many extremely dissimilar, yet the mind is still imagining parallels, correspondencies, and relations, which have no real existence. Hence the fiction of the ancient astronomers, that all the celestial bodies moved in perfect circles; and that of the ancient chemists, who imagined that there were only four principles, corresponding to the heavens, air, earth, and water. In short, all the numerous dreams in which the ancient philosophers so lavishly indulged may be traced to this error. The mistakes in common life which spring from this source are also without number.

With regard to our preconceived opinions, he observes, that when the mind is once pleased with certain things, it draws all others to consent and go along with them. Though the power and number of instances that make for the contrary opinion are greater than those which favour this adopted supposition, yet the mind either does not attend to them, or despises them, or removes, rejects, or explains them away, with a strong and pernicious prejudice to maintain inviolate the authority of its first choice. Hence in cases of superstition, of astrology, dreams, omens, and such like vanities, those who find pleasure in these things, always observe where the event answers to their predictions, but pass over, or but slightly notice, the instances in which their predictions fail; which generally however are by far the most numerous.

The human intellect is most moved by those things that strike it suddenly, enter in at once, and fill and swell the imagination. It is thus carried away before the understanding, which is slow in its movements, can be properly exercised on the subject; and feigns, and supposes, and imagines what is unknown to be like those objects which have already got possession of the mind. It is thus that visionaries impose on themselves and on others; they are soaring away in mid-air with the wings of an eagle, when they ought to be digging with patient research in the mine of true knowledge.

Nothing is a more fruitful source of error among philosophers than that of expecting too much from

the application of their intellectual powers. The mind of man is of course limited in its capabilities. We are surrounded with mysteries on every hand. We cannot move on in any line of thought for any length of time, without soon finding ourselves encompassed with insurmountable difficulties. But the mind of some men cannot rest. It is continually shooting itself out, and pressing on, though to no purpose. Not knowing how or where to stop, it bewilders itself in seeking greater satisfaction respecting truths which lie far beyond the reach of its limited faculties.

The passions and affections also often lead us astray. The light of the understanding is not a pure or dry light, but is drenched in the will and affections; hence what men desire to be true, they are most easily inclined to believe. The understanding rejects things that are difficult, because it is impatient of enquiry; things just and solid, because they limit hope; the deeper mysteries of nature, through the influence of superstition; and the light of experience, through pride and haughtiness. Thus in numberless ways, and sometimes in an almost imperceptible manner, the affections and propensities of men tinge and infect their understanding.

Too implicit confidence in the report of the senses, and drawing improper inferences from them, is another fruitful source of misconception and mistake. The objects of sense entirely engross our thoughts in the first part of life, and are most familiar to us all our days. Hence the dulness, incompetency, and fallacies of the

senses are very generally overlooked. Those things that strike the sense, unjustly over-balance those, that do not; and little or no regard is paid to objects that lie beyond the reach of mere physical examination. We are thus led to judge of spiritual natures as we do of the material objects around us. Hence the human figure and human passions are very generally considered as belonging to the Supreme Being.

An undue fondness for abstraction, generalization, and simplicity, is likewise the source of numerous prejudices. To this cause most of the errors of ancient philosophy may be traced. The evidence which these theories had to support them was next to nothing, but their being reduced to a few simple, regular principles, supplied the place of proof, and obtained for them almost universal support. Thus the principle of gravitation was rejected by the greatest part of Europe for half a century, after Sir Isaac Newton had given the strongest proof of its existence in nature, because it could not be accounted for by matter and motion. Such, then, are the Idols of the Tribe, which belong to the whole human family. These having their origin in the uniformity of the human mind every person is in danger from them.

The second class of idols in Lord Bacon's division are the *Idola Specus*. These are prejudices which have their foundation not in the constitution of human nature, but in something peculiar to the individual. They take their rise from the peculiar nature of each particular person, either with regard to mind or to

body, and are produced by the education, customs, pursuits, and other accidental circumstances, that form the character. If any one should be educated from his infancy in a dark cave till he were of full age, and should then of a sudden be brought into open day, and behold for the first time the wonders of the heavens and the earth, no doubt many absurd fancies, contracted in his seclusion, would still adhere to him, and lead him into erroneous opinions. So is it with mankind; their minds are confined in the cavern of their bodies, which have each their own particular form, and particular manner of being enlightened; and these give false colours, and a delusive appearance to the objects that are seen in their twilight darkness. In this way we receive the images of innumerable errors and falsehoods, from which manifold prejudices spring up, and lead the understanding astray.

Men are fond of particular sciences and studies, either because they believe themselves their authors, or because they have bestowed much pains upon them, or have been peculiarly successful in their prosecution. Their thoughts are thus confined to a certain track, and when they venture out of their beaten course, and apply themselves to any new pursuit, they generally wrest and corrupt it with their former conceits. They judge respecting any subject that comes before them by the maxims of their profession, however foreign these may be from the point in hand; thus they fall into error, and expose themselves to ridicule. Mr. Locke mentions an eminent musician who

believed that God created the world in six days, and rested the seventh, because there are but seven notes in music. And Dr. Reid mentions that the learned and ingenious Dr. Henry More having very elaborately and methodically compiled his *Enchiridium Metaphysicum*, and *Enchiridium Ethicum*, found all the divisions and sub-divisions of both to be allegorically taught in the first Chapter of Genesis. Thus it is when Mathematicians apply to physics, medicine, or chemistry, they endeavour to render all these pursuits mathematical; when Chemists apply to physics, or medicine, they make them chemical; and when Divines apply to philosophy, they attempt to render all their investigations scriptural.

Thus it is that some men of genius are wrapped up in admiration of antiquity; others treat the ancients with contempt, and admire and value only that which is modern. Some are afraid to venture out of the common road, and their views, opinions, and principles, if they can be said to have any, are, like their clothes, cut according to the fashion; others are fond of singularity and paradoxes, and are never at rest except when indulging some strange conceit or new fancy. Some are desultory and changeable in their studies and opinions; others are too methodical and tenacious. Some are so taken up with the particles of which things are composed, that they neglect their structure; while others view the fabrication of things with so much astonishment and attention, that they never enter into the simplicity of nature. Both

these methods of study ought, however, to be taken by turns, that the understanding may be at once rendered more piercing and more capacious. All these peculiarities, resulting from the circumstances of the individual, shut him up as it were in a den, and prevent him from taking clear and comprehensive views of the objects presented to his notice. Hence the fanciful name given to the prejudices that are thus formed. If therefore we would dislodge the idols that are produced in this way, and which reign in this dark cavern, we must come out into open day; we must seek truth not in the seclusion of our own minds, but in the wide world that is open before us.

The next class of prejudices are those denominated *Idola Fori.* These are the prejudices peculiar to the market place, which have their origin in the imperfection of language. In all places of public resort, or wherever the general intercourse of mankind is carried on, words are used in a lax and capricious sense; hence they are ever ready to mislead and deceive. This is perhaps the most prolific source of prejudice. Misconceptions insinuate themselves into the mind from the association of words and terms. Men generally believe that their reason governs words; but it often happens that words retort, and reflect their force upon the understanding; and this is the source of numerous errors. Words are generally imposed according to vulgar conceptions, and must therefore have many imperfections, specially when applied to philosophy and the sciences. Most of the serious controversies of

learned men terminate in disputes about the meaning of words. Mr. Locke in his Essay on the Human Understanding found it necessary to occupy a great portion of his admirable work in pointing out the various kinds of words, their imperfections, abuses, and remedy. Almost every treatise on philosophy must be begun by defining and explaining the terms that are to be employed. But even these definitions do not altogether meet the wants of the case, and remedy the evil; for the definitions themselves consist of words, which in some circumstances may deceive as much as those for which they are substituted.

The idols which words impose on the understanding Lord Bacon classes under two heads; the names of things that have no existence—and the names of things that do exist. Of the former he mentions the *primum mobile*, the orbs of the planets, the element of fire, and the like figments, which arise from imaginary and false theories. Many terms of this kind exist at the present day, such as *chance*, *fortune*, *nature*, which, having nothing corresponding with them in actual existence, are used in a vague indefinite sense, and often lead to most serious errors in judging and reasoning. As there are things which, through want of being observed, remain without names, so there are names coined which have no things corresponding to them; and from this source many of the idols of the understanding take their rise. The other head includes those idols that are imposed upon us by words which are the names of actual existences,

but which are confused, ill-defined, and formed by a rash and unskilful abstraction. Lord Bacon selects the word *moisture*, as an example, and endeavours to ascertain how far the things agree that are signified by this term, and shews that it is a confused sign for different actions that cannot be reduced to one determined signification. Thus, moisture signifies—that which is indeterminable of itself and cannot fix—that which yields easily every way—that which readily divides and scatters itself—that which easily unites with itself and runs together—that which easily flows and is easily put in motion—that which readily sticks to another body and wets it—and that which is easily melted, or reduced from a solid to a liquid. Now, when this term comes to be employed, with an exception of some of the significations, flame will be moist; with the exception of others, air is not moist; with the exception of some others, fine powders and glass may be said to be moist. He therefore concludes that the notion conveyed by this term has been inconsiderately taken from water, and other common liquids, and has not been truly verified, or made to agree precisely with the thing which it signifies, before it was adopted. Much therefore remains to be done before the imperfections of language can be removed, and a sufficient copiousness and distinctness be given to the terms used both in philosophy and in common life. Whether this will ever be completely effected is more than problematic; since, as long as our knowledge is imperfect, language, which is the instru-

ment of thought, as well as the means of communicating it, will also remain imperfect. It would appear, then, that the abuse and imperfections of language will ever need to be guarded against, as one of the most fruitful sources of error.

The last class of prejudices are those which Lord Bacon denominates *Idola Theatri.* These are the prejudices of fashion and authority, which spring from great names, or from following a master; which arise from the systems we adopt, or the sects which we have espoused. These, like the representations of the stage, are calculated to impose on us; hence the appellation which they have received. Prejudices of this kind are neither founded in our nature, nor secretly insinuated into the understanding, but are openly palmed upon it by false theories, and perverted laws of demonstration. These false theories have ever abounded in the philosophical, political, and religious worlds; and they have this in common with dramatic representations, whence the prejudices thus derived have their name, that they are more neat, elegant, and pleasing, than the reality of human life. Those who invent these erroneous systems lay their foundation in some hasty deductions, and then fill up the system from their own invention and imagination. Thus a very pleasing theory may soon be reared, very wide indeed from the truth, but which may more powerfully strike the vulgar, and command assent, than any system founded in truth and nature. Thus the Cartesian philosophy is much more agreeable to read

than the Newtonian; just as the conjectures of a wild and vigorous imagination are much more imposing than the plain dictates of common sense.

Now, when any false system, either of philosophy, or politics, or religion, is received into the mind, it becomes the medium through which every other subject is contemplated. These objects thus acquire a very different colour from what they would otherwise have, if they were beheld by a mind free from these conceits. A Stoic and an Epicurean; a Whig and a Tory, a Churchman and a Dissenter, will frequently take a very different view of the same subject; not only when it relates to their peculiar tenets, but when not at all connected with these peculiarites. Still these prejudices are more particularly seen in reference to their favourite sects, or doctrines. Thus the zealous abettor of some favourite theory, in any particular science, will not listen to any arguments that can be brought against it: the political partizan is loud in the praises of his party, while he expects nothing good from those who are of a different opinion: and the religious bigot will maintain the most egregious errors, merely because they are a part of the creed he has espoused, and against those, who only claim the same right of judging for themselves which he claims for himself, he will thunder all his impotent but malignant anathemas. Thus it happens also with regard to the numerous petty enmities that are continually taking place in the various circles of mercantile and domestic life. The dislikes and partialities thus formed, are

conveyed from one to another; those who have influence impart them to those who are in some way or other under their authority. The destructive consequences to the peace of society, thus occasioned, cannot be calculated.

Such are the various sources of error which fill the mind with prejudices, and pervert our judgments and reasonings. The connection which this subject has with the application of the Science of Reasoning must be at once obvious. In many instances, although our arguments may be faultless, both as to the reasoning process, and the evidence on which they rest, if the mind be preoccupied with any of the prejudices enumerated above, we shall find it almost impossible to produce conviction. Hence the necessity of dislodging these idols, and of seeking as much as possible to free the mind from their pernicious influence, both in searching after truth ourselves, and in endeavouring to communicate it to others. To adopt the language of the great *Restaurator* of true science, "these several sorts of Idols are all of them to be solemnly and for ever renounced, that the understanding may be thoroughly purged and cleared; for the kingdom of man, which is founded in the sciences, can scarcely be entered otherwise than the kingdom of God—that is, in the condition of little children."

CHAP. V.

OF THE CONNECTION WHICH LOGIC HAS WITH GRAMMAR AND RHETORIC.

To every department of literature and science Logic bears a very intimate relation; but to none more so than to Grammar and Rhetoric. The former of these branches of study treats of the principles and structure of Language, and points out the purity, precision, and propriety that should obtain in words and sentences. Rhetoric advances a step farther, and shews how we may best gain the object which discourse proposes to accomplish, whether that be to please or instruct, to convince or persuade. These two branches of study when united enable us to communicate our thoughts to others, either in speech or writing, with purity and precision, with force and elegance. It is evident, then, that they are intimately connected with Logic which helps us to think, judge, and reason, with readiness and accuracy. If the terms which we employ are not clear and distinct; if we cannot easily discern wherein objects agree and disagree, and pronounce accordingly; and if the inferences deduced from these decisions are not drawn promptly and conclusively, it will matter little that grammatical purity and rhetorical elegance have been preserved. With these important studies, then, Logic should be associated, if we wish to reap, with the greatest

advantage, the benefits which they are each intended to communicate.

Grammar may be looked upon as the introduction to logical pursuits; and though its office be not dignified, it is nevertheless of indispensable necessity. Without a knowledge of the rules and principles developed by the Grammarian, it is impossible to advance a step in the prosecution of logical enquiries with any hope of success. The various definitions, distinctions, and classifications, which lie at the very threshold of this Science, in many instances, belong almost as properly to the one study as to the other. Logic has for its object the laws of thought, in so far as the reasoning process is concerned; but as language is the medium of thought, and as these two exert a mutual influence on each other, it is necessary that language, in some degree, come under the consideration of the logician. Here then it is that Grammar and Logic meet; the one takes up, and prosecutes, and applies to its own use, what the other had previously prepared. A knowledge of the principles and rules which have led to the formation of artificial signs for the communication of thought, and an acquaintance with the different classes of such signs, with their various functions, combinations, and accidents, must be valuable both in a speculative and practical point of view. It was by considering speech and language in this way that the science of Grammar was produced, which consists of two kinds, the one *popular*, the other *philosophical*. The former is

intended to aid us in the speedy and perfect acquirement of languages, so that we may intelligibly communicate and understand the ideas which are conveyed from one to another in the common intercourse of society, whether by speech or by writing. This branch of Grammar therefore treats of the order, connection, and dependance of words as laid down in rules of syntax and construction; and whoever enters on the study of Logic without having previously made himself intimately acquainted with the principles and rules there developed, undertakes a difficult if not an impracticable task. But that part of Grammar which has been styled *philosophical* moves in a higher sphere. It is employed in examining the nature and powers of words; and its office is to enter into the philosophy of languages. It is when taken in this latter sense that Grammar is seen to be intimately connected with Logic. The first part of Logic, which treats of terms, enters deeply into the philosophy of language. Much depends, in every process of argumentation, on the mere verbal part of the argument; and, in so far as this is concerned, the labours of the Grammarian and the Logician very nearly coincide. But, properly speaking, the former prepares the way for the latter, introduces him to the right path, and removes many obstacles that would materially impede him in prosecuting his journey.

As Grammar may be considered the introduction, so Rhetoric is merely an extension of this Science. The object which Logic and Rhetoric propose to ac-

complish is in some respects the same, since they are both intended to produce conviction by a process of reasoning. But the manner in which they accomplish this end is different. The Logician has his premises laid before him, and his office is to draw a conclusion from them: on the other hand the Rhetorician has the conclusion given, and his object is to seek for arguments by which it may be established. The one is the Advocate, who has to exert his talent and ingenuity to find arguments to support the cause he has espoused: the other is the Judge, who has to determine whether these arguments are valid or not. The subject matter of both may be the same; and, in so far as the bare process of reasoning extends, that is, of course, also the same in both. But Rhetoric proceeds farther than the mere process of reasoning. It has to invent arguments; to find out those that are most suitable for the matter in hand; to arrange them in their proper order; and so to state and enforce them, as shall be most likely either to illuminate the understanding, please the imagination, influence the will, or move the passions. It is evident, then, although these two branches of study are intimately connected, that the one advances much farther than the other. As an acquaintance with Grammar is necessary before we can properly enter on the study of Logic, so a knowledge of Rhetoric is essential to the successful application of the Science to practical purposes. These three branches of study, therefore, naturally follow each other in the order we have specified, and tend mutually to aid and perfect each other.

It appears, then, from what has now been advanced, that Method, although generally brought forward as a distinct part of Logic, and dignified with the name of a *logical instrument*, belongs more properly to Rhetoric than to Logic. By *method*, as it is explained, we are to understand the arrangement of our thoughts in such a manner as shall best aid the mind in the acquisition or communication of knowledge. It includes more than mere order. It is such a disposition of our mental stores as may lead to their increase, or to their most efficient application; it is such an arrangement of our thoughts, on any particular subject, as may lead us most easily, and speedily, and safely, from one branch of it to another, till we ultimately obtain a clear and adequate acquaintance with the whole.

The utility of such an instrument no one will deny. It will preserve the mind from confusion and mistake, and greatly facilitate our attempts both to acquire and impart information. We are far, then, from depreciating the rules that have been laid down on this subject, and which are generally given in works on Logic, as a fourth part of the system. But as *method* is perfectly distinct from the *reasoning process*, and is subservient more especially to the art of communication, we prefer assigning it to Rhetoric, to which it seems more properly to belong. This will more evidently appear if we glance for a moment at the two principal divisions of method, the Analytic and the Synthetic.

By the Analytic Method we arrive at the know-

ledge of a subject by taking it as a whole, and resolving it into its component parts. The procedure in this case is from generals to particulars, from a whole to its parts, from effects to their causes. This method is employed, not so much in the arrangement and classification of known truths, as in the search after those that are not yet clearly ascertained. It has therefore been called the *method of invention*, because it observes the order in which our minds are employed in the invention or discovery of truth. The Synthetic method is just the reverse of this. We here begin with the elementary parts of a subject, and trace them up till we ascertain what it is as a whole. In this case the process is from the simple to the compound, from the parts to the whole, from causes to effects. This has been called the *method of instruction*, because it is most commonly employed in explaining and communicating knowledge to others. These two methods, then, have evidently a special reference to the business of the Rhetorician. By the one he *invents* his argument; by the other he *arranges* them so that he may most effectually instruct, persuade, or excite those whom he addresses. The rules that have been laid down respecting method, and those relating to the writing of *themes*, and the conducting of *disputations*, which are generally given in connection with it, we therefore hand over to the Rhetorician, since they belong more properly to his Art, than to the Science of Reasoning.